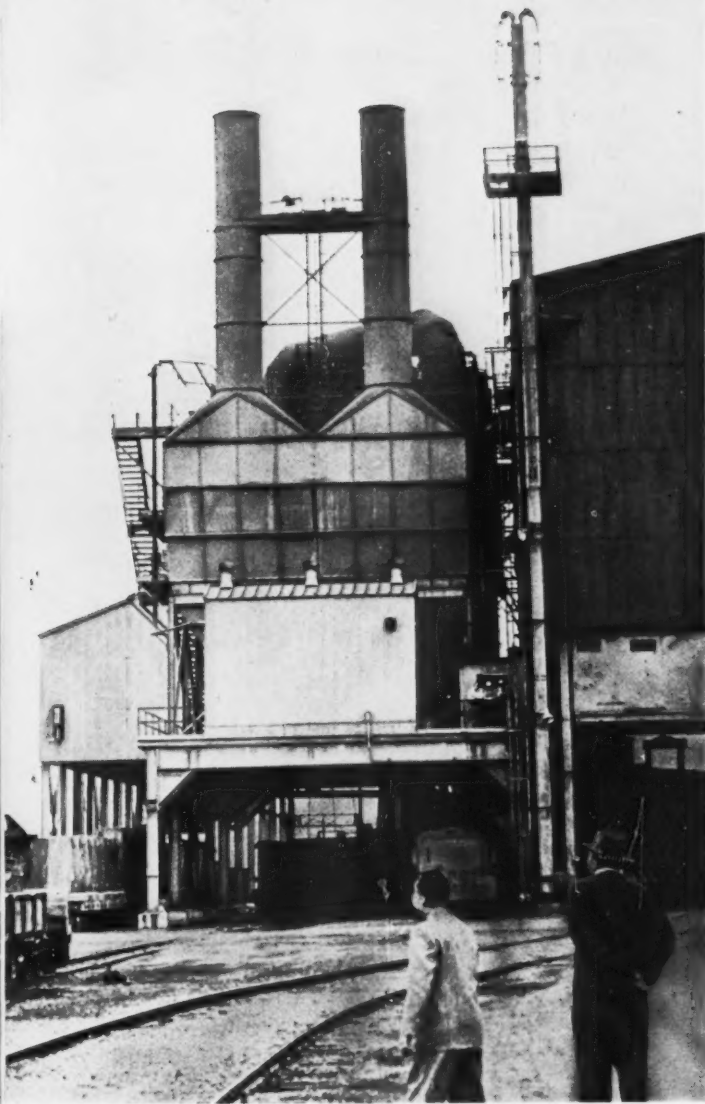
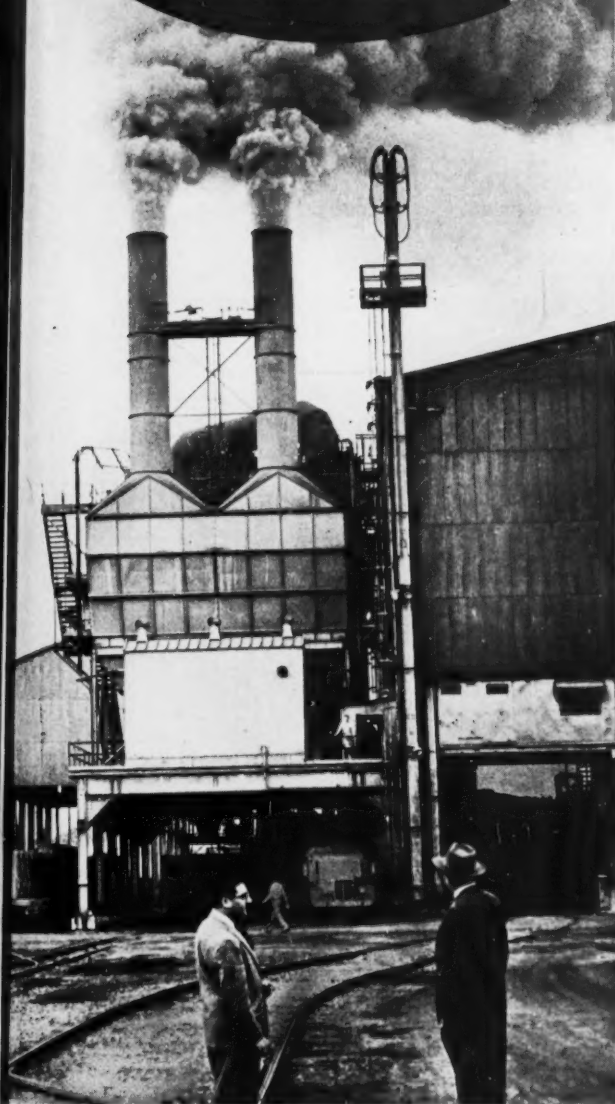


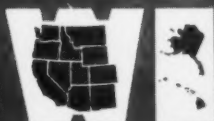
# western industry



Photos demonstrate effectiveness of air pollution control equipment. See page 29.

JANUARY

1961



featuring: **SPOT WELDING OF STAINLESS STEEL STUDS**

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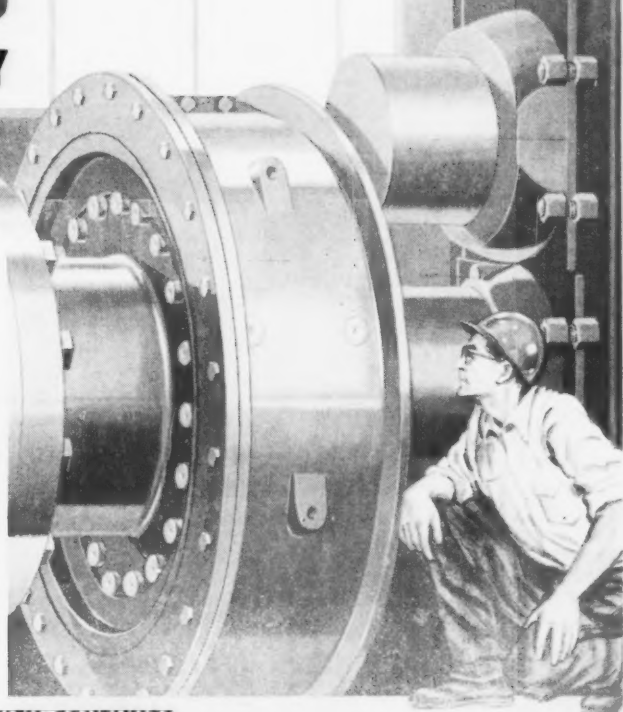
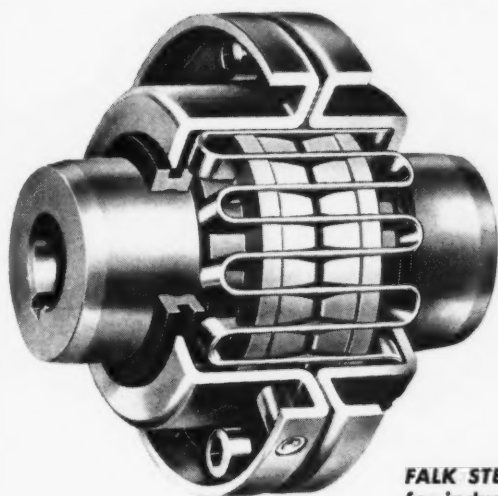






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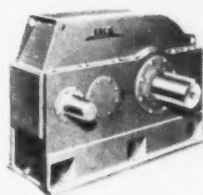
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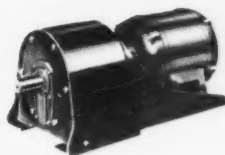
A **Point to Ponder**...When you need gear drives or shaft couplings of "FALK OR EQUAL" quality, where but from Falk can you get the "OR EQUAL"?

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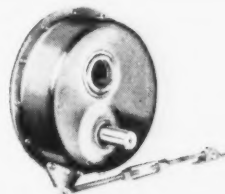
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JANUARY - 1961

Vol. 26

No. 1

western  
industry



SERVES THE THIRTEEN WESTERN STATES

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*Parts and identification are first placed on card*



*Cards are assembled on production lines and carried to skin-packaging machine*



*Unskilled operator completes the packaging operation on PAK-O-VAC machines*

Boeing's Transport Division in Renton, Washington, had a major problem when packaging *repair kits* and "*modification kits*" used by Air Force and airline mechanics. Everything from the smallest washers to larger production-type items went into individual paper bags. For example, the "leading edge" modification kit contains 4,600 separate pieces. It was impossible for mechanics to keep an eye on each item buried in a paper bag and hidden away in cartons, consequently the loss rate of parts was high.

Now kit components are mounted on fiberboard and tightly sealed with a transparent plastic film. All part numbers, contract and job identifications and instructions are designated on the face of the card. Everything is plainly visible. Inspection and parts count can be made quickly and accurately on this production line operation.

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Skin-packaging is also being used for other purposes including *inventory handling*, eliminating the old and expensive bin method of parts control. Parts are counted at a glance, shelf life is increased, breakage reduced, shipping weight and bulk substantially lowered.

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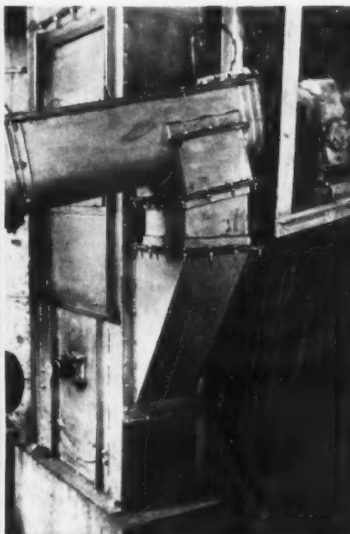
The plant engineer must treat every conveying job as a brand new project; the material to be moved has its own peculiar characteristics; distances, elevations and surroundings vary to affect operating conditions. Selecting a conveyor requires a thorough knowledge of the factors involved.

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western  
industry

**western  
meetings**

### Material Handling Show Starts Feb. 22

THE MATERIALS HANDLING Institute Pacific Coast Show is being used by many manufacturers to introduce for the first time in the West their new material handling and protective packaging products. This is according to a survey conducted among nearly 100 exhibiting firms. Results indicate that a majority of manufacturers intend to show western buyers at least two new products per company. In some instances, says MHI, a single exhibit booth will present three products new to western buyers. Among the product categories represented will be new hand and powered industrial trucks, racks, intra-plant containers, conveyors and their controls, portable elevators, narrow aisle, and high-stacking lift trucks, plus marking equipment. The current market value of such new products reported by exhibitors ranges from \$400 to \$18,000.

"Profit\$ Through Integrated Handling and Packaging" is the general theme of the Sixth Annual Materials Handling and Packaging Conference that will run concurrently with The Material Handling Institute Pacific Coast Show.

Both events will be staged in San Francisco's Cow Palace. Dates of the Show are February 22 through 24. The technical meetings will be held on the mornings of February 23 and 24 commencing at 9:00 A.M.

Hours of the Show are 11:00 A.M. to 6:00 P.M. on February 22; 11:00 A.M. to 9:00 P.M. on February 23; and 11:00 A.M. to 4:00 P.M. on the final day.

Two separate conferences and one joint session will be held in the North Hall each of the two mornings, according to Ellis H. Woolley, general conference chairman. Woolley is employee development officer at the Naval Supply Center, Oakland, Calif.

Registration fee for conference participation is \$15.00 for the two days, and \$10.00 for one day participation. These fees are specifically for the conferences. There is no admission charge to the MHI Pacific Coast Show.

Speaking on the various aspects of "Profit\$ Through Integrated Handling and Packaging" will be such nationally known industry authorities as Charles J. Zusi, packaging consultant; L. L. Adams, U. S. Steel Corp.; Dwight C. Brown, General Services Administration; and Alan Grayson Lynn, Eitel McCullough, Inc. These and the other nationally known authorities on the program will discuss the many advantages gained through integrated handling and packaging operations.

Some of the specific subjects to be covered at length are: "Integration of Handling and Packaging for the Space Age"; "Why Integration of Handling and Packaging?"; "Coordinated Packaging"; "How to Break Bottlenecks in Material Handling."

This conference is jointly sponsored by the Northern California Chapter of the American Material Handling

Society, Inc., and the Golden Gate and Central California Chapters of Society of Packaging and Handling Engineers. The sessions also have the support of the industrial engineering departments of both Stanford University and the University of California.

Robert A. Sherry, Industrial Division, Martin Bros. Container and Timber Products Corp., Daly City, is conference program chairman. He reports that a registration center for the conference will be established on the mornings of February 23 and 24 in the Cow Palace. For advance registration, or more complete details, inquiries should be directed to the registration chairman, William L. Dalton, 151 New Montgomery St., San Francisco.

### Metals Society Plans for Technical Sessions



PLANNERS FOR THE ASM 12th Western Metal Exposition are shown during recent Los Angeles planning session. From left, Norbert Vinatieri, reception chairman; William V. Ward, general manager, Los Angeles Chapter, ASM; H. A. Curwen, Congress chairman and past chapter chairman; and Chester L. Wells, manager of exhibitions, ASM, Metals Park, Novelty, Ohio.

MEETING WITH MEMBERS of the Los Angeles Chapter, American Society for Metals during a planning session for the 12th Western Metal Exposition, March 20-24, T. C. DuMond, exposition manager announced that 32 technical sessions will be held at the Ambassador Hotel concurrently with exhibits at the Pan Pacific Auditorium.

Adding to DuMond's announcement was Wayne A. Reinsch, program chairman, who lists program topics as metals research, process metallurgy, value engineering, laboratory methods, heat treating methods, metallurgy for advanced design, vacuum and consumable electrode melting.

The balance of the 32 sessions will be devoted to the United States Air Force, Society for Nondestructive Testing, Metals Society of the AIME, American Society for Testing Materials and the Society of Aerospace Materials and Process Engineers, Reinsch added.

Exhibiting under the theme "Idea Center for Industry—West" will be hundreds of firms scheduled to occupy display space in Pan Pacific Auditorium and adjacent pavilion.

Show exhibitors will be furnished admission-invitations for customers and prospects by applying to Chester L.

(Continued on page 12)



## EASE THE PROFIT SQUEEZE WITH AN **AUTOMATIC<sup>®</sup> GAS LIFT TRUCK**

A truck that's down for repairs costs plenty. So does one that gulps fuel. AUTOMATIC's answer: a truck with no clutch to shift or wear out, no complicated torque converter to breakdown . . . a truck that saves you up to 30% on fuel . . . and yet costs no more to buy.

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increase your output with CF&I**

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**1** Black Satin finish will not "flake off" in surface scales—a problem with ordinary Oil Tempered Wire finishes that require constant adjustment of the initial setup and result in costly machine downtime. And, Black Satin is highly uniform from one end of the coil to the other, from coil to coil and from lot to lot. Because your equipment does not have to be altered to cope with varying physical properties of the wire, you minimize initial setup time . . . increase your output per shift . . . reduce scrap losses on long runs . . . and receive uniform end products. "Stop-and-go" operations are almost nil when new coils are started.

**2** Black Satin lengthens your production runs, because CF&I can supply you with this top quality Oil Tempered Wire in continuous unwelded lengths up to 600 pounds in weight. These large coils minimize the rethreading time required by smaller coils. Black Satin is available in a full range of gages and sizes and in coils from 16" to 72" in diameter. Straightened and cut lengths from 6" to 24' (or longer) can also be supplied.

**3** Black Satin is color-tagged for ease in handling. To assure uniformity of quality from coil to coil, CF&I color-tags every coil of Black Satin for a reliable record of its processing, testing and intended use. To reorder your particular type of Black Satin, you merely return the appropriate tag to us. This tagging system simplifies your inventory control, in-plant storage and materials handling. These tags, three of which are illustrated here, show:

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Date \_\_\_\_\_  
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Oil Tempered Wire is only one of the many types of quality specialty wire produced by CF&I. Each is packaged for your production: on returnable "spiders" holding a continuous length of wire weighing from 2000 to 4000 lbs.; on non-returnable "spiders" of 500 to 700 lbs. capacity; in fibre-drum holding up to 600 lbs. of wire; in steel-strapped or wire-tied coils from 200 to 2000 lbs.; and in bare or paper-wrapped coils, or in 500- to 800-lb. reels.

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## MEETINGS

(Continued from page 8)

Wells, ASM show manager, Metals Park, Novelty, Ohio.

Each admission-invitation will entitle the holder to register free to attend the show throughout its five-day run.

Other members of the Los Angeles show committee are H. A. Curwen, Earle M. Jorgensen Co., convention chairman; William V. Ward, International Nickel Co., LA Chapter chairman; and Don Roda, Rocketdyne, publicity chairman.

Reservations for the dinner-dance of the Congress-Exposition set for March 23 already are being taken by Fred H. Curry, entertainment chairman, Trent Tube Co., Room 201, 1901 W. 8th St., Los Angeles, 57.

Another affair being sponsored by the Los Angeles Chapter is a March 20th luncheon featuring Maj. Gen. O. J. Ritland, Commander, USAF Ballistic Missile Div., as guest speaker.

### Military Electronics Convention Will Cut Down Side Interests, Emphasize Technical

AT THE 1961 Winter Convention on Military Electronics, which will be held in Los Angeles at the Biltmore Hotel, February 1-3, everything possible has been done to simplify the process of convention-going. According to Chairman A. N. Curtiss field trips have been cut down and only one social event is scheduled. Exhibits and technical sessions are being held in adjacent areas in the hotel.

"We want our members to be able to take full advantage of the opportunity to exchange technical information without having to fight the clock. We think our expected 3,000 visitors will enjoy this 1961 get-together and we're doing our best to insure it.

"Our technical program will involve the presentation of 80 papers, in 20 sessions. Of the 80 papers, 20 will be

classified. The technical sessions are planned for Wednesday afternoon, Thursday morning and afternoon and Friday morning and afternoon. Current plans call for two field trips, one daytime and one evening.

### Material Handling Chapter Discusses Data Processing



AT A MEETING of the AMHS, Northern California Chapter in San Francisco, the subject was the use of data processing machines in distribution industries. Shown left to right are guest speaker John O. Todd of IBM, Leo Delventhal, Chapter President, and Howard Fisher, Chapter Treasurer.

### Engineering & Management Course Offered At UCLA From January 23-February 2

AN INTENSIFIED 10 day short course for engineers and managers is offered by the University of California at Los Angeles starting January 23, 1961, and continuing through February 2. No formal educational requirements are necessary. The course is to be held during days from 8:00 A.M. to 5:00 P.M. each day. Tuition fee has been set for \$450.00. For further information contact the College of Engineering, University Extension, UCLA, 405 Hilgard Ave., Los Angeles 25.

## Calendar of Western Meetings

Jan. 23-Feb. 2—1961 ENGINEERING & MANAGEMENT COURSE. Los Angeles Campus, University of California. Reno R. Cole, College of Engineering, U. of C., Los Angeles 24.

Feb. 1-3—2nd WINTER MILITARY ELECTRONICS CONVENTION. Biltmore Hotel, Los Angeles. National Professional Group on Military Electronics and L. A. Section, Institute of Radio Engineers.

Feb. 16-19—INTERNATIONAL AUTOMOTIVE SERVICE INDUSTRY SHOW. Los Angeles Memorial Sports Arena. Pacific Automotive Show.

Feb. 20-22—WINTER MEETING, PLUMBING BRASS INSTITUTE. Riviera Hotel, Palm Springs, Calif. Plumbing Brass Institute.

Feb. 22-24—MATERIAL HANDLING INSTITUTE PACIFIC COAST SHOW. Cow Palace, San Francisco. Material Handling Institute.

Feb. 26-Mar. 1—PACIFIC ELECTRONIC TRADE SHOW. Great Western Exhibit Center, Los Angeles.

Mar. 12-16—ASME AVIATION CONFERENCE. Statler Hilton Hotel, Los Angeles. American Society of Mechanical Engineers.

Mar. 16-17—CONFERENCE ON DATA PROCESSING PROBLEMS. Numerical Analysis Laboratory, University of Arizona, Tucson, Ariz.

Mar. 20-24—WESTERN METAL EXPOSITION AND CONGRESS. Pan-Pacific Auditorium, Los Angeles, Calif. American Society for Metals.

Mar. 23-25—MEETING OF AMERICAN MACHINE TOOL DISTRIBUTORS ASSOCIATION. Mark Hopkins Hotel, San Francisco. American Machine Tool Distributors Ass'n.

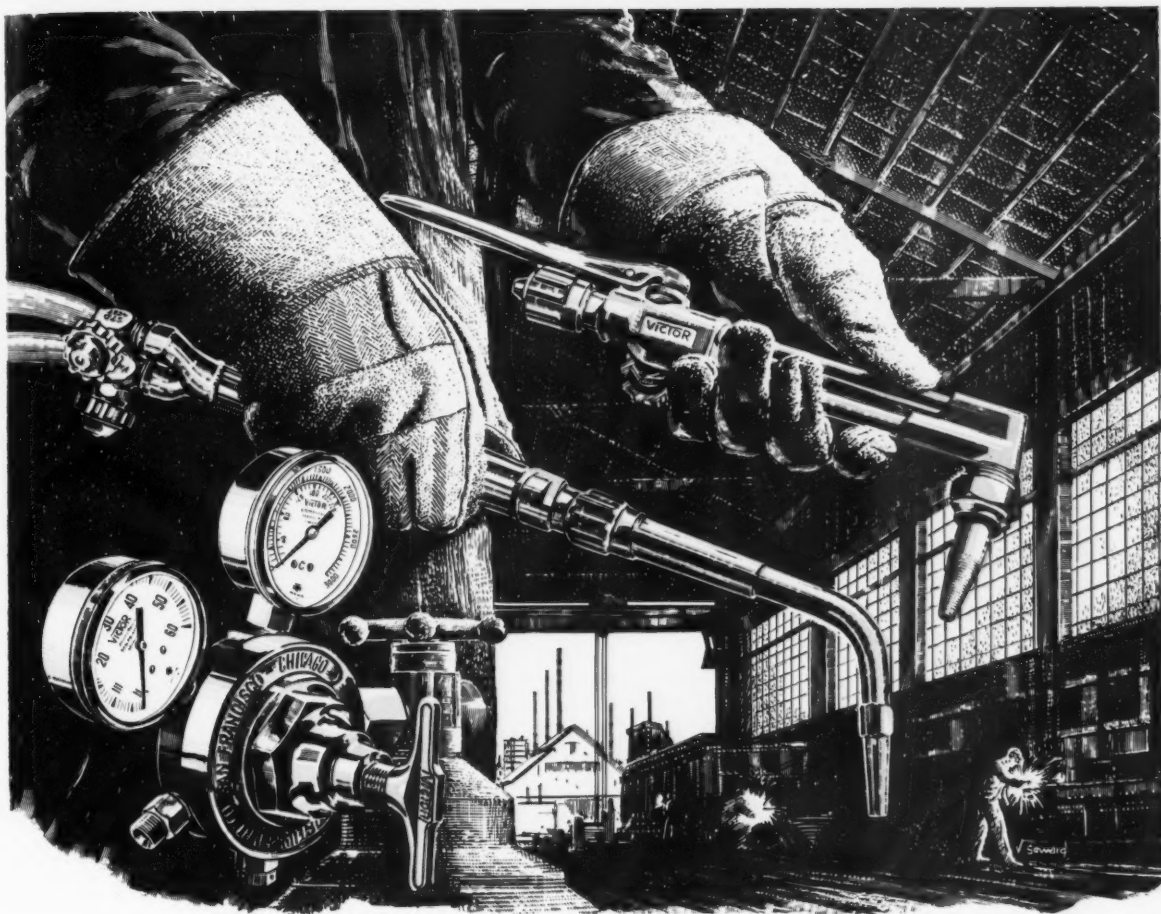
Mar. 27-29—ABWA SHOW OF 1961. Riviera Hotel, Las Vegas, Nevada. American Bottled Water Association.

Apr. 20-21—RAILROAD CONFERENCE. Sir Francis Drake Hotel, San Francisco. Jointly sponsored by American Society of Mechanical Engineers and American Institute of Electrical Engineers.

Apr. 20-21—18th ANNUAL WESTERN SECTION CONFERENCE, SOCIETY OF THE PLASTICS INDUSTRY, INC. Hotel del Coronado, Coronado, Calif. Society of the Plastics Industry, Inc.

May 8-12—CASTINGS CONGRESS & EXPOSITION, National Meeting of AFS. Brooks Hall and Civic Auditorium, San Francisco. American Foundryman's Society.





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WESTERN INDUSTRY / JANUARY 1961



→  
**PLACING STAINLESS STEEL** escutcheon plate on special positioning fixture, operator is preparing to spot weld stainless steel stud to it. Stud is held in lower electrode.



## SPOT WELDING of stainless steel studs

By using stainless steel plate and spot welding studs, this electronics firm has realized an annual savings of \$6,000 over the previous method

**M**ANUFACTURING engineers at Berkeley Division, Beckman Instruments in Richmond, California, were faced with the problem of attaching studs at the four corners of thin stamped metal parts called escutcheons. These escutcheons are made of 22 gauge sheet metal in two sizes, 5x10-in. and 4x5-in., and are used as face plates on the Colorimeters and Centrifuge instruments manufactured by the firm's Spinco Division.

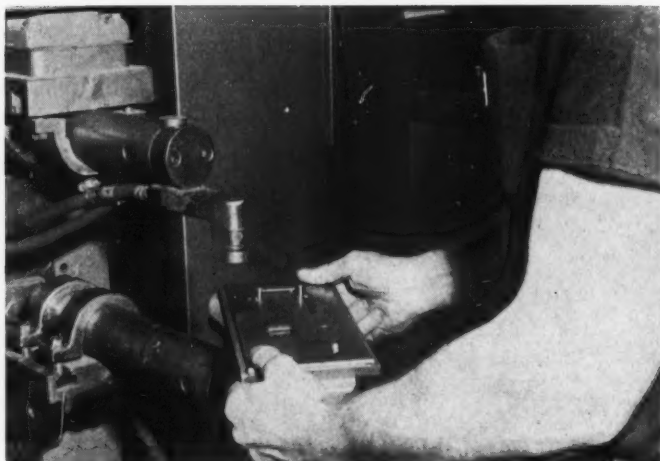
The problem was solved by using for escutcheons material a type 302 stainless steel with a #4 finish and by developing a method of spot welding to it specially designed stainless steel studs.

The first material used was aluminum. Not only was the finish unsatisfactory but when studs were soldered or welded to it, there was corrosion at the point of attachment. Metal adhesives were also tried and while they held well on a straight pull, studs tended to break loose when hit or jarred from the side.

To solve the problem of corrosion the aluminum parts were plated, outside the plant, with an electroless nickel alloy. This formed a hard corrosion resistant coating but increased the cost per part considerably.

A switch was made to a 22 gauge (.031) stainless steel type with a #4 finish. Because of the elimination

→  
*STUDS are spot welded to the inside of this escutcheon plate. Plate is on phenolic positioning fixture. Note upper electrode, which is of a special ball socket, swivel type.*



of the cost of plating this material was less expensive. It provided a chemical and corrosion resistance with an attractive finish that is easily cleaned. The stainless steel is now etched and passivated for appearance at one-quarter of the former cost.

The materials formerly used were not receptive to silk screening rework of the letters and numbers on the face of the escutcheon when this was required. This was due to the staining effect of the catalytic type inks used. With stainless steel the parts can be washed and rescreened or if necessary re-etched without damage. This of course eliminates scrapping of parts due to faulty silk screening.

At this time manufacturing engineers were welding studs onto the escutcheons. The studs used contained projections so that even though modified spot welding equipment was employed, the studs were being projection welded. This method created slight blemishes on the front side of the escutcheon at the point of weld, caused by the stud projection going through the thin plate.

Although told it was impossible to do, Beckman manufacturing engineers developed a method of spot-welding stainless steel studs, flat on the head with no projections, to the escutcheon plates. The method has proved highly satisfactory and has eliminated any surface mar on the front side of the escutcheon.

To do this they redesigned the type 302 stainless steel 8-32 studs with an outside 45 degree chamfer to facilitate their location inside the radius of the formed escutcheon flanges. The studs have a 5/16-in. dia. shoulder to provide a good conductive surface against a special electrode.

A Federal spot welder was then modified. The squeeze mechanism was changed from an electric worm gear to an air squeeze unit and the welding arms on the spot welder were extended to provide an 18-in. throat depth.

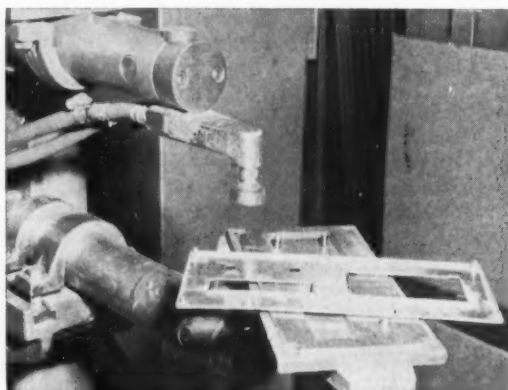
The welder is equipped with 16 taps up through 54,000 maximum amperes. For this job it is usually run at about 20,000 amperes with 15-in. throat depth. To achieve the precise control necessary for this type of operation, a Weltronic control panel is used. It provides cycles for "hold," "squeeze," and "heat."

To assure the required parallel relationship between electrode forces and to prevent any undesirable surface distortion, a ball socket swivel type electrode of 1-in. diameter is used on the face side. A special design stud holding electrode is used on the stud side. Both electrodes are of RWMA Group A class 2 materials.

Due to the high current resistance of the selected materials, settings are for low fusion heat and a short cycle. This results in a small nugget, minimum distortion and high strength. The quick heating and cooling characteristics in austenitic grade stainless steel do not affect the corrosion resistance in the localized area of welding.

A special positioning fixture of phenolic is also used. When a stud is placed in the lower electrode and the escutcheon placed over the fixture, it is held firmly in position for welding.

With a production quota of 300 parts per month, this new method has saved some \$500 per month, or \$1.66 per part.



*COMPLETED ESCUTCHEON PLATE lies upside down on fixture. Four flat head studs have been spot welded to four corners of plate.*



## HIGH STORAGE

### saves space and time

New steel warehouse expansion takes advantage of high storage racks and special purpose cranes for greater efficiency.

**T**O EXPEDITE MATERIAL HANDLING with new mechanical devices, a growing trend in the West is to develop storage capacity that is designed to utilize the greatest amount of cubic space.

New developments in special purpose cranes and racks are spearheading design of vertically oriented storage areas that reach high above floor space, often more than 20 ft. These racks are capable of handling heavy items that were formerly relegated to the plant floor with a resultant loss of many square feet of otherwise productive space.

Countering this is a significant saving in time, space and labor that results from going up rather than spreading out. This is evidenced by Ducommun Metals & Supply Co., a distributor of metals, tools and industrial supplies, that recently redesigned portions of its Los Angeles facility around two sets of huge cantilevered racks and two 5-ton capacity telescoping stacker cranes made by All-State Engineering Co.

Racks taking about 2000 lineal feet of space and occupying 17,500 sq. ft. can hold approximately 6600 tons of flat metal products, thereby releasing 49,000 sq. ft. of floor space for productive purposes. At the same time, material handling, packaging and order picking has been cut to a fraction of its former time.

New racks and cranes had to be fitted into existing service center operations, a number of which would not be directly affected by the new service but would have to be relocated.

First move was an extension of the former warehouse area for 128-ft. to make total length 941-ft. Obviously extreme warehouse length required reduction of distance and travel time for filling orders. Formerly receiving was through a rail spur near one end of the building, shipping was via truck at the other.

Ducommun cut a new main driveway for truck loading operation that runs through the center of the warehouse in crosswise fashion for 300 ft. They added a new rail spur so that each end of the 941-ft. long building could receive railcar deliveries.

Next all cutting, grinding, and packaging equipment was centralized in a belt 100-ft. on each side



*OPERATOR on telescoping stacker crane places pallet load of sheet stock in cantilevered rack. System of vertically oriented storage facilities and stacking cranes expedites order filling and cuts handling damage.*

of the new loading driveway. Adjacent to both areas were constructed cantilever racks designed by A. C. Martin Asc. and fabricated by Bethlehem Steel.

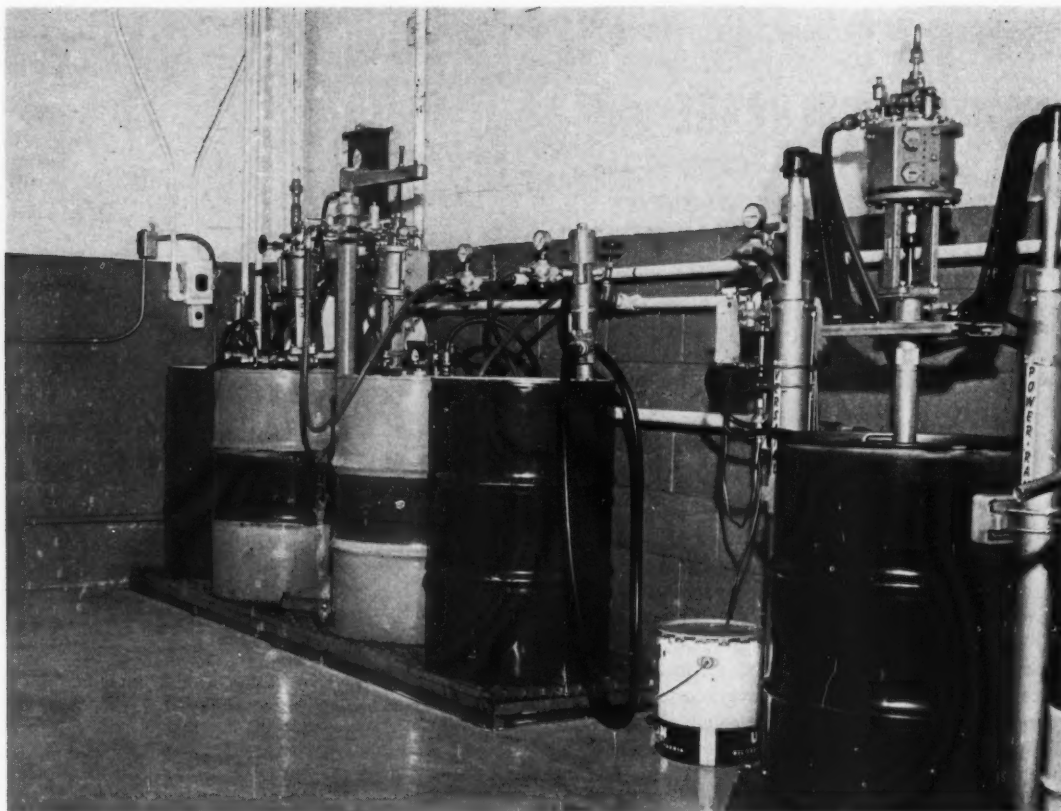
Each set of racks consists of three rows with 10-in. and 12-in.-wide flange beams reaching 21-ft. high. Supported on concrete foundations, each beam has 13 to 16 rows of support arms made of 3-in., 4-in. or 5-in. I-beam. Capacity of arms ranges from 3500 to 10,000 pounds in accordance with weight and bulk of material to be stored and with the suppliers' type of packaging.

Racks occupy a 70-ft. wide bay and are 251-ft. long with 6-ft. aisles for access, enough for the highly maneuverable cranes that service the area. Rack installation has sidelined two major handling problems. Height limitations due to weight and accessibility problems connected with slow moving stock have been eliminated. Also the new racks are not serviced by overriding bridge cranes that require considerable overhead maneuvering room. Space saved has been used for vertical storage. Since each item has its own shelf, not one piece has to be moved or lifted to find another, a significant saving in non-productive labor.

Servicing the cantilevered racks are two 5-ton capacity telescoping stacker cranes, electrically powered and capable of rotating 360 degrees in restricted aisle space. The crane operator by himself is capable of spotting, loading, transporting, and discharging metal to the cutting and packing area.

When floor stacked items were involved, two men were often required to aid the bridge crane operator in locating stock, adjusting slings, and guiding the load to its destination.





*KEY TO CENTRALIZED lubrication system is this spotless oil room maintained under one atmosphere of pressure to keep out dust and cement particles that might pollute oil supplies. Drum, far right, is equipped with Alemite Versatal power ram exerting 6375 pounds atmospheric pressure to remove lube from drum.*

## CENTRALIZED LUBRICATION SYSTEM

### pipes lubricants to key plant equipment

This spread-out cement plant found an interesting solution to its problems of distance, grit contamination and excessive volume.

**LUBRICATION OF PRODUCTION MACHINERY** in Western industries faced with oil contamination problems caused by dust, grit and abrasive particles, is often complicated by the spread-out nature of plant-sites.

A case in point is the Oro Grande, Calif., plant of Riverside Cement Co. confronted with oil contamination factors in the extreme from damaging cement particles generated in a plant covering many acres.

Moving parts of a 60-in. gyratory crusher at one end of the site may require the same lubricant as machinery in a finish mill hundreds of yards away.

To speed and simplify lubrication and to cut wear factors the firm has installed a centralized lubrication

system serviced by pipelines up to 1100-ft. long that fan out from a central oil room like spokes on a wheel.

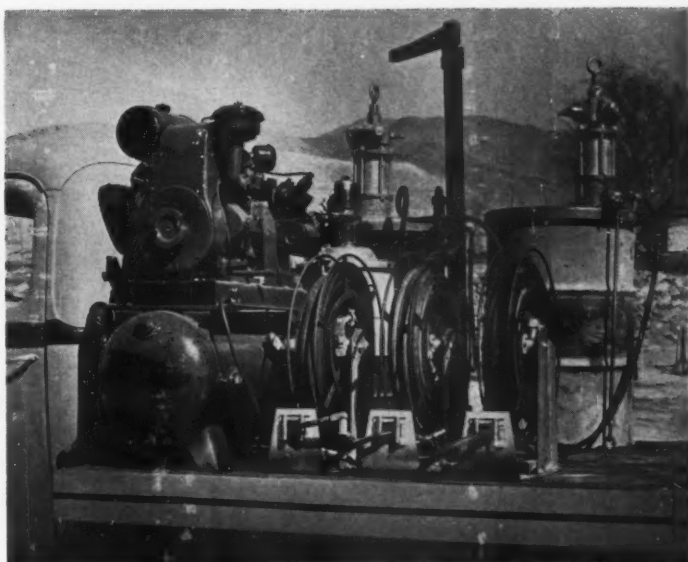
Implementing the pipeline is a complete Alemite lubrication system including pumps, controls, hoses, reels, pressure guns and a number of automatic lubrication systems.

Focal point of the overall system is the oil room, kept immaculately clean and under one atmosphere of pressure to minimize seepage of particulate matter into oil drums that serve as reservoirs for the pipe line.

Alemite pumps force lubricant through oil lines pressurized at 4000 psi to serve lubrication points that may be automatic, with a timed dispensing ap-

→

**TRUCK-MOUNTED LUBE SYSTEM** carries gear oil, general purpose grease, for equipment too distant to be included in centralized system. Truck contains its own air supply to power drum pumps and a hose line used to clean off dirty fittings before lubrication.



paratus, or designed for plugging in of portable hose lines for on-the-spot lubrication of areas with a high concentration of fittings.

For example, an Alemite Tote-A-Hose power lubrication system is plugged into snap-on couplers on the pipeline located at strategic points along a conveyor at the rock storage area. When fittings on the conveyor immediately adjacent to one coupler are serviced the maintenance man can quickly disconnect the line and hand carry it to the next coupler.

The Tote-A-Hose system in this area has cut 5 man days of lube time on the conveyor line to 4.5 man hours, allowing an increase of servicing from once every 60 days to twice every 30 days.

For efficiency, the number of lubricants used at the plant have been minimized to six oils and greases with 90% of the lubrication being done with four of the six types.

Servicing distant areas not connected with centralized lubrication is a truck-mounted system that carries gear oil and general purpose grease. Servicing is accomplished with heavy duty self-winding hose reels.

Lubricant is stored in drums fixed to the truck bed. The truck carries its own air compressor and storage tank for powering Alemite drum pumps and an air line to blow off contaminated fittings prior to lubrication.

Before installation of centralized lubrication, it was the duty of a three-man crew to hand lubricate moving parts of a dust collector and bag house, especially air cylinders that shook the bags at 2 hour intervals. These had a tendency to foul out due to cement dust contamination and wore out quickly.

A stockpile of 50 spare cylinders was needed for quick change, and one man needed to machine and recondition worn cylinders. Today the three oilers do other jobs as does the machinist.

Alemite took over a lubrication problem connected with a ball mill supported by a large shoe that was lubricated by an oil bath reservoir. To add oil, a

housing was opened and lubricant was poured into the system by the bucketful. If this was done as the mill operated, the opened housing admitted cement particles that turned the lubricant into a highly abrasive solution.

Now serviced by a pipeline from the oil room, a turn of a gate valve replenishes the reservoir. Inspection of the oil level is by sight feed. Contamination of the oil is minimized since the housing remains closed.

On another mill, Pitman bearings that formerly wore to 3/16-in. taper in 90 days under manual lubrication were given added service life of up to 4 years with an .008-in. wear factor under automatic lubrication.

This involved application of a pre-engineered quantity of lubricant on the bearing that was sealed in a slightly pressurized housing to prevent entrance of cement particles.

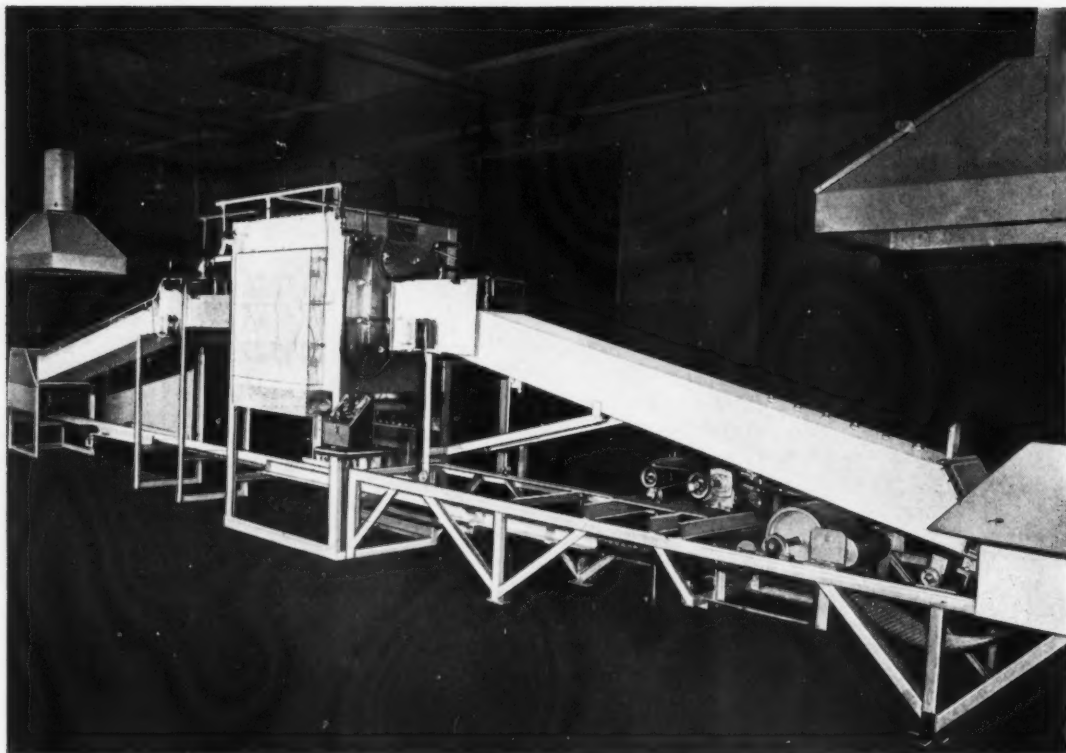
Open gears that power ball mills were formerly lubed with a high viscosity tar lubricant. Protected only with a metal shroud, gears bathed in the sticky solution rapidly picked up airborne dust.

Alemite cut back the viscosity with a highly volatile thinner and developed a spray system to coat the gears that saved 90% of the lubricant. A light coating of the thinner lubricant proved more efficient and had less tendency to pick up an accumulation of particulate matter.

For a number of other applications, Alemite has installed an Oil-Mist system consisting of an automatic lubricator operating on compressed air that ejects micron-sized particles of oil in a smoke-like mist that covers the moving part with a light film of oil.

It is responsible for saving large quantities of oil and prevents spoilage of cement due to oil seepage.

When used in conjunction with a heating element called Thermo-Aire, the Oil-Mist system allows dispensing of airborne oil in viscosities ranging from 1000 to 25,000 ssu at 100 degrees F.



*PERFORMING A COPPER BRAZE on the McCulloch part at Fabriform is this C. I. Hayes humpback controlled atmosphere furnace. Dry atmosphere minimizes diffusion of carbon in part. Dewpoint can be maintained as low as  $-50$  or better during normal brazing operations.*

## BRAZING VERSATILITY aids in production

To solve a production problem this Southern California firm turned to brazing. Using special equipment to keep carbon content high the process is saving money.

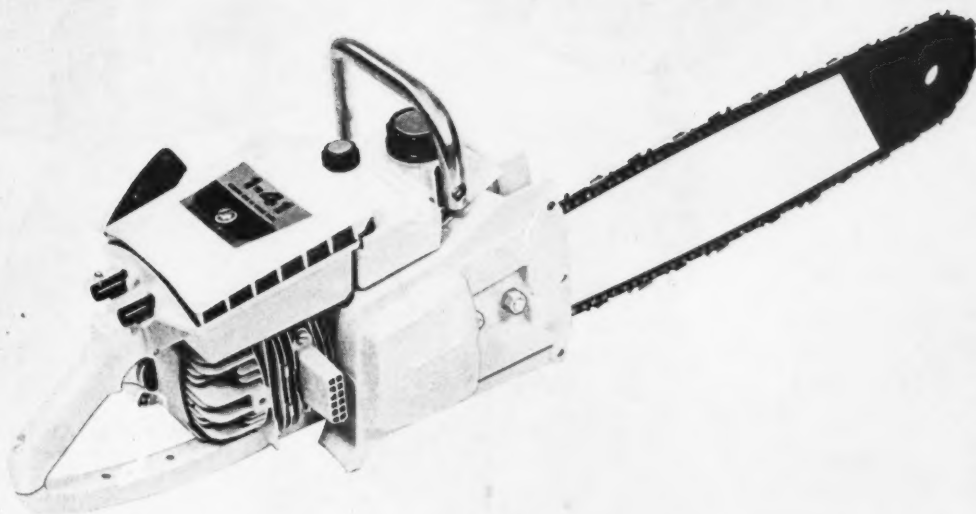
**B**RAZING AS A METAL JOINING PROCESS is chosen by many Western firms because it is usually a less expensive process, produces a stronger product, and in many cases it can be the only practicable method.

When it came to a clutch rotor, a major functional part used by McCulloch Corp., Los Angeles, in their line of portable chain saws, all three considerations had a bearing on design of the rotor as a furnace brazed part.

McCulloch engineers were interested primarily in economy. Brazing the part, which comes in eleven variations, was hit upon as the least expensive method and one of the most adaptable since the assembly consists of 2, 3, and 4 pieces, depending on the model of chain saw involved.

Basic parts involve a hub, spider, plate and yoke. The first two parts are universal to any assembly, the plate and the yoke are the variations.

The rotor, by its function in a four shoe automatic



centrifugal clutch system, is subject to high loading and must resist wear and even abuse in the field. Parts must be fabricated from carbon steel and conform to Rockwell hardness specifications as follows: Spider, R15n-88-92; Yoke, R15n-80-92; and Plate, R15n-80-85.

The problem lies in the Spider, a key part that for wear resistance must retain the highest carbon content of all parts at the end of the brazing cycle. McCulloch engineers realized that under brazing temperature, diffusion of carbon takes place. If all parts required equal carbon content in the finished state it would be a simple matter to carburize them sufficiently to offset the diffusion and the brazing operation would not be as difficult. Such was not the case.

McCulloch brought their brazing problem to Fabriform Metal Products, a Los Angeles brazing firm equipped with a C. I. Hayes humpback furnace. A controlled atmosphere electric brazing furnace, it has the capability for the copper furnace brazing of all alloy steels.

Most important to McCulloch, the Hayes unit permits rapid brazing under very dry atmospheres to insure that parts are properly brazed with a minimum of diffusion. The spider is sent into the brazing cycle more highly carburized than other parts and comes out as a component of a finished assembly with only negligible decarburization.

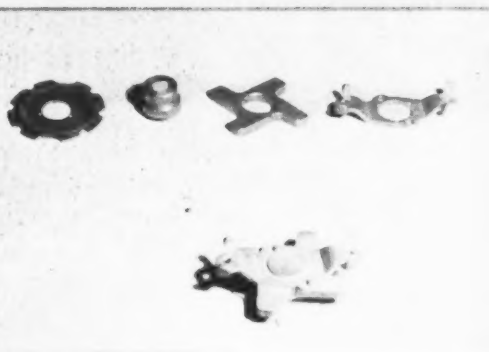
Before entering the furnace, parts undergo careful pre-assembly and inspection. They are received from McCulloch after passing their primary quality control cycles.

Parts are degreased and all except the hub are ball-burnished to remove surface contaminants. They are assembled in a press with staking pins using Fabri-form-built dies. Parts are press fit with one to three stakes and in one of three press operations depending on the type of rotor required, a 2, 3, or 4 piece assembly.

Brazing filler metal is applied by using two free

**TYPICAL OF McCULLOCH chain saws using the clutch rotor is this model one-41 saw, weighing 17 pounds and having a one cylinder, two cycle air cooled engine and a four shoe automatic centrifugal clutch.**

**COMPONENT BREAKDOWN and a complete assembly of a four piece clutch rotor are shown. Consisting from left, of plate, hub, spider and yoke, they are machined to press fit tolerance and are copper brazed. Spider must have the highest carbon content at end of brazing run.**



form copper snap rings.

Brazing is accomplished in the Hayes furnace at 2050 degrees F. under a 100% dry hydrogen atmosphere. Complete fabrication requires 1 1/4 hours from door to door on a conveyorized system. Actual heat zone time is a short 4 1/2 minutes.

Heat is applied with 12 electric attached-type terminal air cooled ceramic heating elements mounted above and below the muffle and running on 100 KW.





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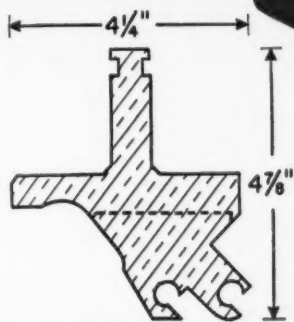
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# S AGAIN-



DOTTED LINE SHOWS where two copper extrusions were brazed together to make original part. When you consider the intricate shape and the weight of the part (a  $3\frac{3}{4}$ " section measuring  $4\frac{1}{4}$ " x  $4\frac{7}{8}$ ", weighing 8 lbs. 7 ozs.), you can readily understand why it was at first thought impractical to make it into a single extrusion.



## Revere helps "fit the metal to the job"

**AND ONE COPPER EXTRUSION REPLACES TWO, SAVING TIME AND MONEY  
WITH CONSIDERABLE INCREASE IN LIFE OF PART**

The Revere Copper Extrusion shown above was originally two extrusions brazed together. And, since it is quite an intricate shape, and weighty, it was at first thought impractical to make as a single extrusion, but the possibility was believed to be worth investigating.

Through close collaboration between the manufacturer's engineering department and the Revere Methods and Production Departments, it was found possible to combine these two sections into a single extrusion. Work was started, dies were made and test runs conducted. The tooling (for hot extrusion was followed by cold drawing) posed special problems. It had to be both rugged and precise in order to produce this monster to the manufacturer's exacting specifications. Finally, a sample extrusion was delivered to the customer for testing and found to be right in every way.

Not only does this new, single extrusion eliminate a great deal of machining but obviates the necessity of purchasing two separate extrusions and brazing them together. This means

substantial savings in dollars and time involved, plus a longer-lasting part, because the heat required to join the two pieces originally used, tended to soften the built-up unit, thus shortening its useful life.

So, before you give up on what at first may seem an insoluble problem, why not call in Revere's Technical Advisory Service? It's entirely possible they can help you "fit the metal to the job" with a resultant saving in the production of a superior product.



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## PORTABLE SYSTEM

### solves conveyor needs

Unit has interesting applications where permanent handling problems are not present or because of space limitations.

**I**N CERTAIN WESTERN PLANTS installation of a fixed conveyor system is not feasible because of space limitations, and to bring permanent service to all plant areas needing conveyORIZED material handling can be a costly venture.

Often what is needed is a portable system that can be directed rapidly to various plant areas where a material handling problem exists.

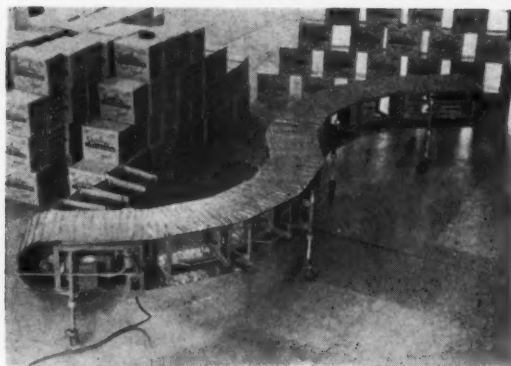
Developed by California Conveyor Corp. is a new unit called Power-Flex, flexible enough so that "S" curves, "U" curves, "L" curves or any combination of these can be obtained rapidly by the operator even when the conveyor is loaded.

The Power-Flex is in use at Fromberg Inc., Maywood, Calif., producer of tire repair kits. Cartons weighing 40 pounds each can be quickly moved from one plant area to another on the metal belt that has a load capacity of 100 pounds per running foot. The conveyor is used to run material through narrow doorways, around corners, up into truck beds and boxcars.

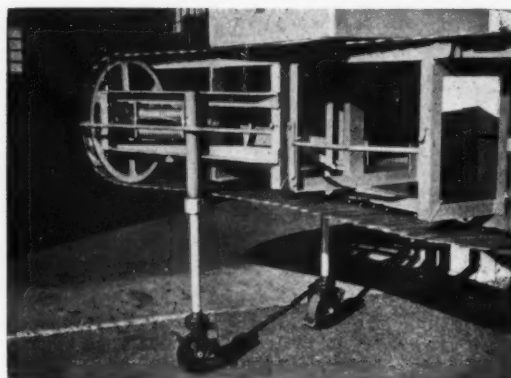
Rolling on five sets of casters, the conveyor can be pushed to a new location and maneuvered into a curved position without shutting off the power. Casters at each end of the system are equipped with locking devices to prevent the conveyor from wandering on slopes or uneven floors.

Further flexibility comes from support legs that telescope from a maximum of 72 inches to a low of 20 inches. The belt is designed so that cartons will not runoff on curves, thereby eliminating side rails. The conveying principle is performed by interlocking metal flights attached to a continuous flexible chain.

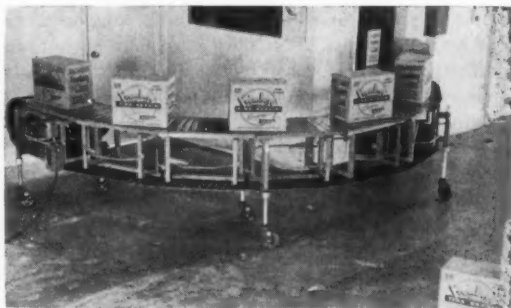
Power is supplied by a 220 Volt single phase 3 hp electric motor equipped with a V-belt drive, 20-1 worm gear reducer and forward and reverse controls.



*FLEXIBLE CONVEYOR* used to move 40 pound cartons is snaked into an "S" curve. Belt is a series of metal flights hooked to continuous chain. It can be moved when running.



*CLOSEUP SHOWS* details of telescoping legs and lightweight sections that make up conveyor. Legs have 52-in. adjustment to adapt to any truck bed or box car entry.



*MANEUVERED INTO* a 180 degree turn, belt brings cartons through tight doorway leading to interior storage area. Casters at each end of system lock to prevent wandering.

## STANDARD ENGINEER'S REPORT



### Rocket parts meet rigid testing with Chevron Cutting Oil

In machining parts for today's rocket motors, exacting precision is required to meet very rigid specifications.

**Government inspectors** give a microscopic examination to every fitting turned out by the Boudreau Machine Co., Modesto, California.

**The metal used** is extremely hard—#321 stainless—and a superior cutting oil is necessary to keep the cutting tools from wearing. Seven years ago, Mr. Boudreau, Company Presi-

dent, found such an oil when he switched his plant to Chevron Cutting Oil 33DA.

Since then, tool life has increased and rejects have been reduced. Mr. Boudreau reports, "Chevron Cutting Oil 33DA has saved us hundreds of dollars . . . has eliminated work discoloration and gumming of ways and slides on tool drilling machines."

**Equipment note:** Part forming is done at 150 FPM with drilling and tapping at 25 FPM.

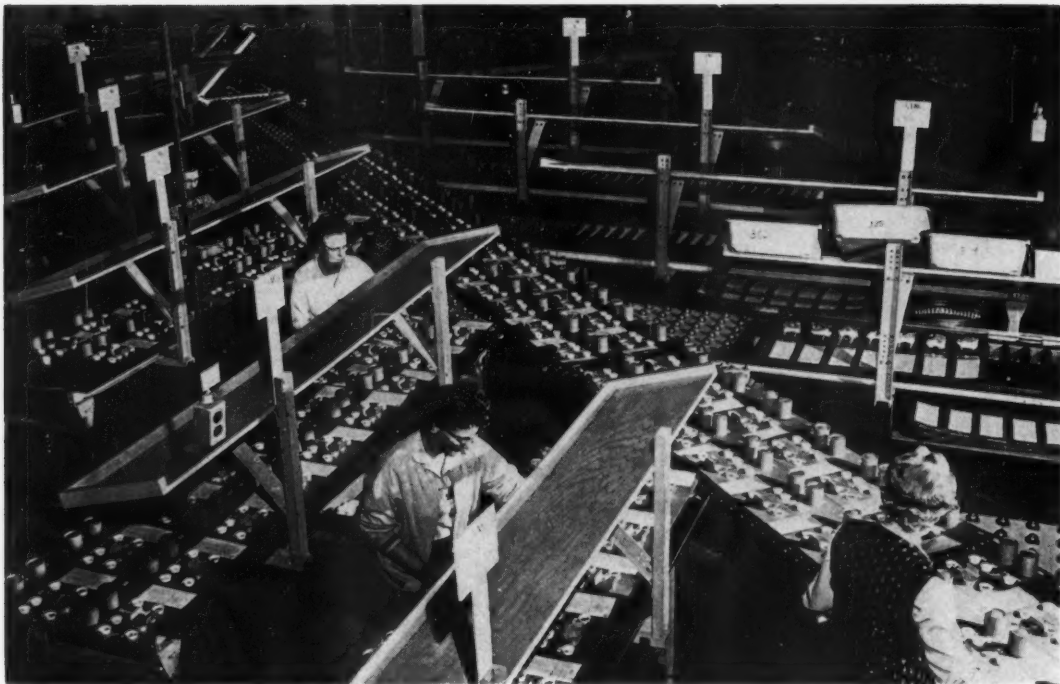
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## STANDARD OIL COMPANY OF CALIFORNIA

TRADEMARK "CHEVRON" AND CHEVRON DESIGN REG. U.S. PAT. OFF.



*CONVEYORIZED PACKAGING LINE at Boeing shows workers making up kits by placing series of parts in designated areas on board. Parts will later be sealed in tough plastic film.*



This method, commonly associated with consumer goods, has many industrial uses.

**P**LASTIC VACUUM PACKAGING, called "skin packaging," wherein parts are fixed to a corrugated backing card and held there by a thin sheet of transparent polyethylene or other polymer has replaced the paper or plastic bag in a growing number of Western plants and in doing so has advanced low cost inventory control and materials handling.

Hardware to perform this type of packaging and an integrated system of handling and inventory control to go with it are a development of Product Packaging Engineering, Culver City, Calif.

An example of their skin packaging benefits is found at Boeing Transport Division, Renton, Washington,

where handling of packaged parts destined for inclusion in airplane repair kits become a problem.

All parts, ranging from tiny washers to larger production line items formerly were handled in individual paper bags. On-the-job loss rate was high. Even the most careful maintenance worker would loose tiny washers and parts in a jumble of crumpled paper. Numbers were also a problem with one kit holding 4600 separate items.

A new series of kits were developed by Boeing through working with Product Packaging Engineering. The corrugated backing card was designed to carry a letter designation for each part affixed to it. A



quick visual check of the card can indicate if all parts are present. Location of letters, that vary with different kits, are standardized by use of a series of templates.

As the backing card proceeds down a series of conveyors, parts are mounted in designated areas. Included on the board is a card indicating job, contract and individual part numbers.

Finally the entire card is sheathed in a tough plastic skin that reduces part damage from vibration, dust and corrosion during handling operations. Excessive protective wrapping and boxing are eliminated.

Performing the skin packaging operation is a Product Packaging Engineering Pak-O-Vac machine, electrically operated on 220 volt single phase and 3 phase current or 440 volt, 3 phase.

The operator places the backing card with parts affixed in the bed of the unit. Electrically heated plastic film is automatically laid over the entire card. A combination of heat and suction from a vacuum pump draws the adhesive plastic tightly around each part on the board and fuses it permanently.

Any sharp object can be used to break the plastic for removal of the parts, one-by-one, as assembly steps are followed. If a shift break occurs, the next worker can tell at a glance just how far along his predecessor had advanced. Parts remaining on the backing card logically would still have to be used or assembled.



**WORKER HOLDS** backing card designed for use on Dial-A-Part conveyor system. Entire card will hang in conveyor and each part can be removed as a completely packaged unit. Machine is Pak-O-Vac Model 24, skin packaging machine similar to one used at Boeing for kit packaging.

Carrying this system one step further is use of skin packaged backing cards for an entire inventory of replacement parts or off-the-shelf items.

An inventory system called Dial-A-Part utilizes parts-holding backing cards that are carried by a conveyor system. Backing cards can hold a series of parts each identified with a part and inventory number and can be perforated so that one-by-one parts may be torn from the card without taking the remaining parts from the conveyor.

For example, a card with 16 perforated sections can carry a like number of individually packaged parts. As each perforated section is removed the last remaining inventory number on the conveyorized card gives an immediate visual tally.

Parts can be located rapidly by using a selector dial that activates the conveyor to bring the required item to the operator.

Eliminated is costly bin storage. Inventory maintenance and checking for damage is rapid due to transparent coverings and less frequent due to protective qualities of the plastic. Non-productive time spent searching through bins can be reallocated. The conveyor can be designed to bring parts on command from storage to fabrication areas.

In addition to packaging capabilities, Pak-O-Vac units are used for forming parts over molds, can produce a wide variety of tote boxes and shipping containers from tough, heavy gage plastics and polymers.

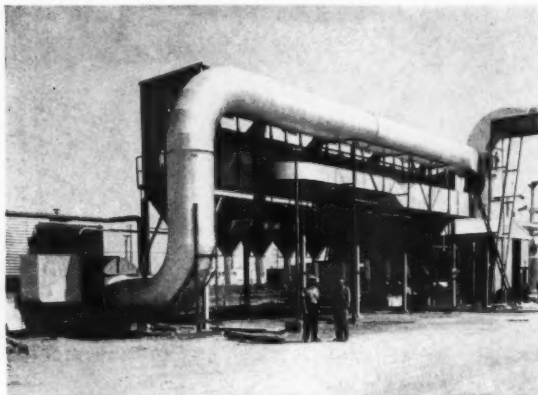


**COMPLETED SKIN PACKAGED** kit shows full set of parts with letter designations for guiding maintenance workers. Tag, upper left, states job, contract and part numbers for each item included on board. Note high visibility of plastic coating.

# OUTLOOK:

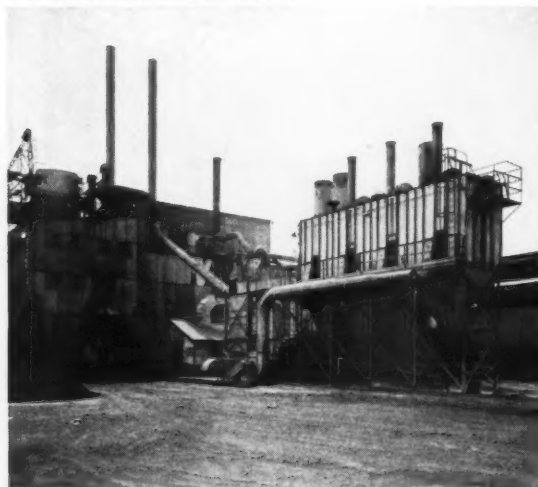
clear skies and clean stacks—

## ELECTRIC FURNACE FUME CONTROL



This continuous, automatic type Wheelabrator Dustube collector has cleared the air at a prominent western steel company, through effective control of electric furnace fume, a field in which Wheelabrator has more successful installations than all other makes of collectors combined.

## GENERAL DUST CONTROL



This Wheelabrator Dustube Collector serves a large building materials manufacturing plant, in ventilating the cupola furnace used for melting slag in the manufacture of rock wool.

**WHEELABRATOR**  
**DUST AND FUME CONTROL**

## thanks to WHEELABRATOR® Dustube® Collectors

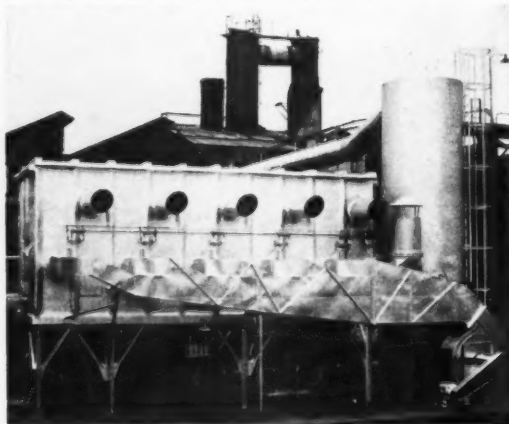
When the air pollution ordinance demands a "clean stack," your most economical answer is a Wheelabrator Dustube Collector. Wheelabrator delivers the economy you want and the collection efficiency you must have, at the most favorable cost/efficiency ratio.

Throughout the West, Wheelabrator-engineered dust and fume control systems are successfully meeting the most stringent codes while handling difficult and demanding applications, including the filtration of hot and corrosive gases.

Invariably, Wheelabrator Dustube cloth bag filtration proves to be economical in initial cost of equipment and continuing cost of operation, yet is easily capable of delivering collection efficiencies above 99% and providing discharges free of visible solids.

For the practical and effective answer to your air pollution problems, consult your Wheelabrator dust and fume engineer. For details, call or write Wheelabrator Corp., 632 S. Byrkit St., Mishawaka, Ind. In Los Angeles, 2602 East Foothill Blvd., Pasadena. In San Francisco, P. O. Box 1087, Station A, San Mateo.

## FOUNDRY CUPOLA FUME CONTROL



One of the most demanding applications of dust and fume control equipment is the ventilation of foundry cupola operations. This Wheelabrator Dustube collector is successfully meeting the strict Los Angeles code.

... for more details, circle No. 13 on Reader Service Postcard  
WESTERN INDUSTRY/JANUARY 1961



*BAG HOUSE installed in Western plant and designed to control dusts generated in processing, handling and bagging of non-metallic materials. This outside unit by Rees Blow Pipe can eliminate 4 tons of non-reusable dust over a 24 hour period. Also installed in same plant, but not shown, is bag house inside plant for control and collection of dust that has value and can be reused.*

## WESTERN AIR POLLUTION CONTROL

A SPECIAL



REPORT

Here is the situation throughout  
the West as it pertains to industry.

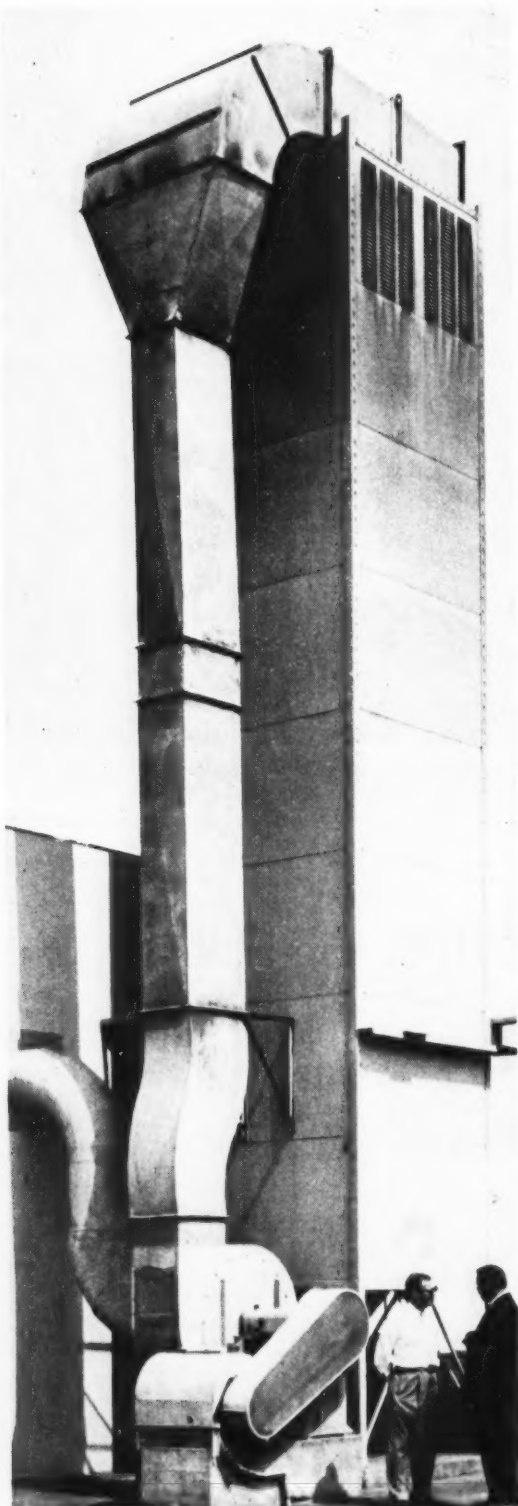
**A**IR POLLUTION is a catch-all phrase covering any pollution of the air by all types of particulate matter or gases. Particulate matter may be classified as smoke which contains both solid and liquid particles; dusts, such as cement dust; fumes, which have solid particles formed by condensation of vapors; and mists, which are liquid particles. Gaseous wastes are of many types but the most common are sulphur oxides, hydrogen fluoride, nitrogen oxides and various components of motor vehicle exhaust.

Since no two areas are identical in the pollutants emitted, air pollution varies somewhat from area to area. It is difficult to compare one area with another because of this dissimilarity and other variables. One

fact is certain. To have air pollution of any kind there not only must be pollutants but also insufficient air movement for ventilation.

Experts in the field recognize two styles of air pollution. The first is the point-source, where one particular source, such as an industrial plant is individually polluting the air in the local area around it. This is identified easily, if located in a non-metropolitan area and its correction is of an individual nature.

The second source is a community-wide source. All large metropolitan areas, when they reach a certain point, create, within themselves, a problem of air pollution. The pollutants come from individual homes with furnaces and trash burnings, from a concentra-



**RECLAIMING VALUABLE GOLD** dust, created during manufacture of gold alloy wire, sheet and special forms for the electronic field, is accomplished by this Western Precipitation combination cyclone type dust collector and bag house at Handy & Harmon Co., El Monte, Calif.

tion of automobiles, from commercial and industrial firms which are common to all large metropolitan areas such as asphalt plants or junk yards burning tires, etc. It also comes from various industrial plants which have located in the metropolitan area. This community-wide source is a collection of all pollutants into which any large point-sources are combined.

When discussing where air pollution exists in the West, we are not concerned primarily with the point-source type of air pollution but with the community-wide type.

The public today uses the word "smog" to define any complex type of air pollution. Experts, however, consider that there are two kinds of smog, the Los Angeles type and the London type. The Los Angeles type is photochemical in that exhausts of automobiles react chemically in the sunlight to form nitrogen oxides and olefinic hydrocarbons. The London type smog occurs at night or on cold foggy days where coal is the principal fuel used. It is characterized by its high content of sulfur compounds and particulate matter, whereas the Los Angeles type is characterized by its high content of ozone, organic matter, and nitrogen oxides and by its oxidizing effect on chemical reagents. It is with the Los Angeles type smog that the West is concerned. Since 1950 it has spread throughout the West Coast.

Each area in the West, having an air pollution problem, is located where a set of atmospheric conditions can, on occasion, limit the natural ventilation. Air pollution becomes a problem when two atmospheric conditions are present simultaneously. In general, winds blowing horizontally must be less than 5 mph and natural updrafts must be curtailed due to a low lying layer of air which is warmer than the air below. This is called an inversion layer. These two conditions confine the pollutants in an area and cause them to accumulate.

#### ALASKA

The state has passed only nuisance legislation on pollution of water or air, although it anticipates that Juneau could have a possible future problem.

#### ARIZONA

The state has passed a county control act to conduct research. Two areas have shown interest.

The first vestiges of the problem have been noticed in Phoenix and surveillance type studies have been made.

There is an awareness of a possible future problem in Tucson which has been heightened because of the city's health center aspect. A preliminary study has been made and plans are to continue studies locally.

#### CALIFORNIA

While air pollution has become a problem throughout the West in no other area is it more intense than in the industrial complex of Los Angeles County. The Los Angeles Air Pollution Control District was the first area in the West to have stringent controls regulating emission of contaminants. It was set up before 1950 as the result of a California legislation allowing counties to form such districts. A key factor in the



control of air pollution in this District is its permit system. Laws have been passed regulating the amount of emission of different types of pollutants. When a firm installs a piece of air pollution equipment on a furnace, etc., the Los Angeles District reviews the equipment and the installation and issues a permit to the effect that the firm is allowed to continue to operate the device providing the air pollution equipment is used.

The Los Angeles air pollution problem is considered to be mainly one of automotive exhausts at the present time. This is being controlled by a state regulation that will require automobiles to use exhaust control devices. Industry in the Los Angeles area has complied with regulations. The only industrial problem concerning air pollution is a constant supervision on the part of the District to see that compliance is maintained. Los Angeles has been called the city with the cleanest industry in the country. Its air pollution is increasing, and the increase is expected to continue until the motor vehicle exhaust law enters the phase where exhaust devices are actually installed.

The Bay Area Pollution Control District covers San Francisco, Alameda, Contra Costa, San Mateo, Marin, and Santa Clara counties. It is the result of a special bill by the California legislature. Unlike the Los Angeles District the special legislation passed does not allow the use of permits. The Bay Area District does not use a permit system but issues a citation for non-compliance or not meeting standards set up. While Los Angeles has completed its set of control regulations most other areas in the State are in various stages of this process. The Bay Area District has adopted two regulations. The Regulation 1 covers open burning not applicable to individuals; Regulation 2 controls emissions of smoke, dust and combustion products from incineration. Thus, while undoubtedly future regulations will be passed, present ones do not apply to hydrocarbons and other gaseous emissions of the type found in the petroleum and chemical industries.

Industrial firms in the Bay area are having to seriously consider what steps must be taken to comply with Regulation 2. Many, particularly the smaller plants, are finding it expensive. According to Robert L. Daugherty, California Institute of Technology and a member of the Los Angeles District Air Pollution Control Hearing Board, it is not uncommon for control equipment to cost 20% or more of total plant outlay. He cites the case of a \$40,000 plant with \$10,000 worth of control equipment and a \$1.3 million operation with a \$320,000 air pollution control system.

William J. O'Connell, a member of the Advisory Council of the Bay Area Air Pollution Control District, says this about the problem, "Industry cannot avoid nor evade air pollution control. The threat to move, sometimes raised, is an idle one. Where do you go? Any community that is attractive to industry and can supply industry with a labor force will want clean air, too, if not today, in the near future.

Industry can best achieve its primary goal, regulation that is worth what it costs, by three steps:

1. Adopting an attitude of acceptance of public demands for reduction of air pollution to safeguard

human health and comfort, and to cut down economic losses, such as smog damage to many crops.

2. Taking action, by representation in the legislative process, to assure that the regulations are:

- a. Realistic as to engineering and technical requirements.

- b. Feasible as to costs.

- c. Equitable as between what the community will gain by reducing pollution and what it will pay in taxes and higher prices.

3. Aiding research — and doing its own — toward more effective controls and more efficient compliance in the future."

Orange, Riverside and San Bernardino County Air Pollution Districts have adopted emission standards largely following the pattern set by Los Angeles, but not as comprehensive. All require permits and have requirements on particulate matter such as smoke, dust, fumes, sulfur dioxide. They have not adopted rules on backyard incineration by individuals or on sulfur content of fuel oil or olefin content of gasoline for sale. Orange County adopted its regulations in 1955 and the others within the last two years. All three districts are experiencing Los Angeles type smog. Since Orange County has had its regulations in effect longer, industrial compliance is further along.

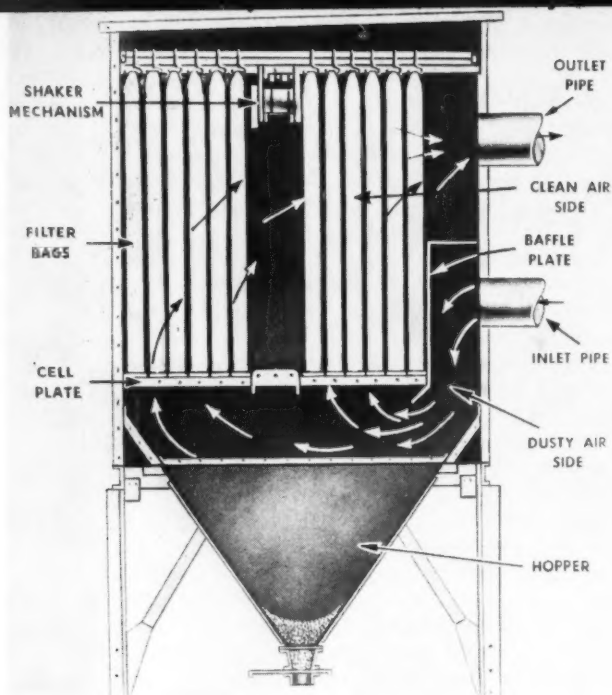
In 1955 San Diego Air Pollution District was started. No regulations have been adopted, though a program is in process to measure pollutants and evaluate the nature and extent of the emissions. While San Diego has pollution typical of any metropolitan area, its major problem is motor vehicles. Air pollution of an industrial nature has been labeled non-existent to limited, since most of its industry is of a nature that creates no pollution problem. When an occasional problem does appear an attempt is made to work out the problem on an individual voluntary compliance basis.

In 1959 the Sacramento District was formed. Like San Diego, it has not adopted regulations as yet but is making studies on the nature and extent of the pollutants. Unlike San Diego, the problem includes industry. The program has included an attempt to reduce dump burning on a voluntary compliance basis.

The San Joaquin Valley has experienced the first vestiges of air pollution. Occasional limited episodes have occurred from time to time where air pollution was noticed. This valley contains weather conditions which are ideal for air pollution and the day can be foreseen when the problem could be acute. At present, on occasion, there is some eye irritation on the most sensitive people and limited crop damages.

## COLORADO

Denver is experiencing a general type of air pollution, which, when weather is favorable, forms a blanket of air pollution. Due to a peculiar meteorological condition the blanket will tend to shift north and south daily. Denver has been in the process of getting an air pollution ordinance and it is likely that the ordinance has already been passed. Preliminary hearings have been held and minor revisions are now being made. Final enactment is expected in two or three



*CUTAWAY VIEW of Wheelabrator Dustube collector shows how contaminated air is filtered and returned to the plant or discharged into the atmosphere.*

weeks from the time of this writing. The ordinance is a broad type air pollution ordinance as distinguished from smoke control and provides for permits being required for construction or remodeling of installations, equipment or devices, which may cause air pollution.

#### HAWAII

This state has passed a state air pollution control act and operates on a statewide basis. There is a full time officer from the State Board of Health. The ordinance is of the Los Angeles type with a permit section, though more limited in scope. Downtown Honolulu has experienced some general air pollution of a minor nature.

#### IDAHO

The state recognizes no general air pollution problems, only point-source problems. Idaho has passed a law setting up a 10 man commission to make studies and adopt codes.

#### MONTANA

The state appears to have only point-source problems.

#### NEVADA

Reno has been aware of and concerned with the problem. Air pollution comes from several point-sources. There is no local air pollution ordinance.

#### NEW MEXICO

The state has passed only nuisance type legislation

and appears to have only point-source problems.

#### OREGON

Portland has a smoke control ordinance and an officer. It is currently considering a broader type of ordinance. Portland, like other metropolitan areas, contains all types of air pollution. It has an industrial problem, too, which includes odor from pulp mills. One current problem is on disposal of demolition waste.

Eugene has an air pollution ordinance and an officer. The main concern is industrial waste wood burning from T-pee burners.

Medford has shown interest in air pollution control and is planning legislation.

#### UTAH

The Salt Lake Valley area is experiencing air pollution which extends as far north as Ogden and south to Provo. Meteorological conditions in the valley are extremely favorable for air pollution. Salt Lake City has an air pollution ordinance and several officers. Extensive sampling tests have been taken. However, there is no ordinance outside Salt Lake City. Much of the pollution comes from industries located in the valley outside the city. It consists of  $SO_2$  fluorides and particulate matter. The state of Utah has requested an area survey.

#### WASHINGTON

This state has a law that enables local areas to form control districts and provides for research at local and state levels.

Seattle is considering an air pollution ordinance but has yet to decide whether to operate on a city or metropolitan basis. It has a general type of air pollution and is concerned mostly with particulate matter. There is an industrial problem here along with the general metropolitan air pollution.

A smoke control ordinance is in effect at Tacoma, and an officer has been hired to enforce it. The Ringelman chart is used. Industrial air pollution comes from pulp, paper and wood processing industries.

Spokane has been concerned with air pollution, since it, like Tacoma, lies in an industrial valley which is conducive weatherwise to periodic episodes. There has been some damage to fruit in the area. A survey has been in process and a local ordinance may have been passed, although according to information on hand, the city has only a zoning ordinance that takes cognizance of air pollution.

#### WYOMING

The state has passed only nuisance type legislation and appears to have only point source problems.

#### AIR POLLUTION EQUIPMENT

The installation of air pollution equipment is a highly technical field and one in which experts often disagree. One point where there is agreement is that each installation should be considered separately as to the type and size of equipment used. Among the variables are the nature of the pollutant, desired efficiency, cost of installation, maintenance and running costs.

type of area, nature of item, available space for installation and many others.

Concerning the selection of equipment, Dr. Philip L. Charley, vice president, Truesdail Laboratories, Inc., and Chairman, Air Pollution Committee, American Council of Independent Laboratories, says, "The most important thing for the manufacturer or processor is to know what he is putting into the air and how much of it there is. He can best get this from his own staff, if he is large enough to carry such specialized personnel, or from an independent source. As a case in point, one processor passed his fume through a leaky water scrubber. The volume of air leaking into the scrubber rendered it inefficient and the company proposed to correct the difficulty by the installation of incinerators, bag houses or other equipment. A test showed that most of the fume was air and that much of the problem could be solved by patching some holes."

There are four basic types of equipment in common use today in the West to recover dust and other particulate matter prior to stack discharge or exhaust from other sources.

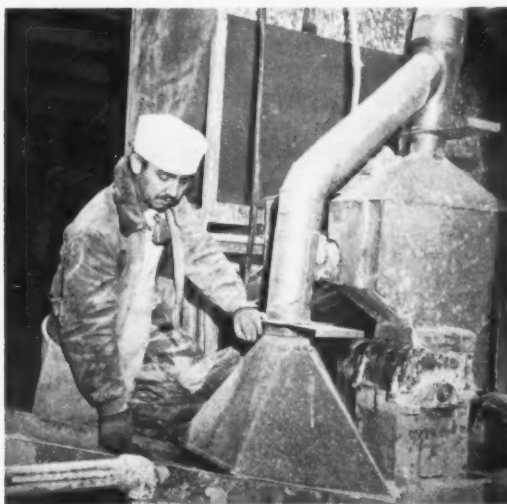
They are used for the most part in Western cement, steel, paper, mining, chemical, metallurgical, rock processing and power generation industries.

**INERTIAL COLLECTOR**—A device using centrifugal force and/or gravity to separate dust from a gas stream. Both the straight large diameter "cyclone" type and the more common multiple cyclone type units use a rotary motion of gas to impart a force to dust particles to separate them from the gas stream. It is rather inexpensive, easy to maintain, and, in areas with low population density, is often all that is required for pollution abatement. It is most satisfactory in retaining material larger than 10 microns in size.

**BAG FILTERS**—The basic designs usually incorporate woven cloth or a felted material. There has been development in recent years in the materials used and synthetic and mineral type fabrics are now available. These have been able to stand a considerably higher temperature than cloth. Bag houses work by accumulating solid particles on filter surfaces which forms a "filter cake." This periodically is dislodged, either mechanically, or by hand. The most common type uses a system of shake bags or a reverse jet system, in which air, under high pressure, is introduced through a slot in an encircling ring to blow dust from walls of the filter element. Filters are highly efficient and especially suitable in industries in which valuable dusts are collected for reclamation.

A Wheelabrator Dustube dust collector is saving an estimated \$2,550 a month on only one operation in a Los Angeles tile firm. The problem solved here was loss of scrap green tile, as much as 8,000 pounds a day. This is a dry tile body, with only 7% moisture content. During tile forming and on through inspection, much tile is discarded and wasted. At this firm, however, the scrap is now taken in barrels and dumped into a portable bin, then goes to a conveyor, through a pulverizer, up an inclined belt into a blunder, where water is added. Dust created in this handling is trapped by hooding and ductwork and carried to the dust collector. Although reclamation of green tile is the major salvage operation at this plant, other savings are made here by similar collectors.

**WET COLLECTORS**—These operate by bringing dust-laden gases in contact with either a water film or spray. Some wet collectors involve a cyclone system or a centrifuge. Generally, initial cost is quite



*THIS FIRM, Gladding, McBean & Co., Los Angeles, is saving an estimated \$2,550 monthly since installing a Dustube collector for monitoring every step in green tile handling and during and after pulverizing. Photos show two of these locations where dust is collected.*

# ACME attachments designed for AUTOMATION



Time and time again, Acme Engineers have proven that made-to-order conveyor chain attachments need not be costly. They have produced hundreds of special attachments for standard roller chains that are practical in design, outstanding in performance and lower in cost.

At Acme, special attachment costs are lowered through modified design and development. From a wide selection of standard attachments, Acme Engineers incorporate as many standard parts as possible into each special attachment produced, giving you higher productivity while lowering your initial maintenance costs. Acme Chains are available in a complete range of sizes from  $\frac{1}{4}$ " pitch to  $2\frac{1}{2}$ " pitch.

Whatever your requirements, call or write Acme's Engineering Department for a practical solution to your attachment problems designed from your specifications.



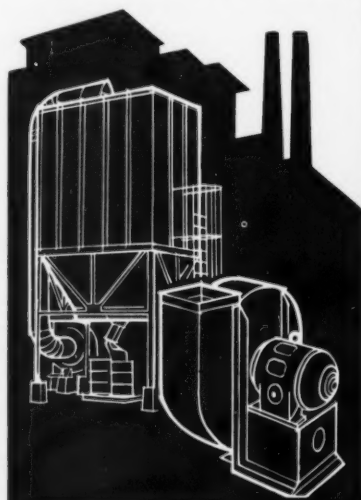
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ROLLER CHAINS, SPROCKETS, CONVEYOR CHAINS, FLEXIBLE COUPLINGS, ATTACHMENTS. (Special and Standard)

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- Cloth Tube Dust Arrestors
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Y



Photo Courtesy Electric Boat — a division of General Dynamics Corporation, Groton, Connecticut.

## FOR EVERY APPLICATION, THERE'S ONE CRANE OUTSTANDING...

**IN SHIPBUILDING** ... One of the many sensitive jobs in the construction of the "Ethan Allen," the U. S. Navy's newest nuclear powered missile submarine, is "setting the sail" — lowering the streamlined super-structure into position. It's a job that demands brute strength combined with razor-sharp precision control. A P&H overhead crane with P&H Electronic Stepless Magnetorque Control handles this assignment quickly, safely, and confidently.

As in every crane installation, P&H engineers have taken all factors affecting performance into consideration. The individual requirements, as well as the special problems, of this shipyard are integrated into the overall design. Result: performance that is never in doubt, dependability that users have counted on for over 76 years!

Job-engineering like this is the only proven way to keep your crane operating costs to a minimum — year after year, decade after decade. Why not find out more? Send for Bulletin C-68, Dept. 130, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

*Modern, all-welded construction eliminates excess bulk and weight in P&H's girder design. This means less wear, lower maintenance because there's less load on crane bridge wheels and support structures. In addition, cover-plate breakage is eliminated. Trolley-wheel loads are transmitted directly to web plates . . . no rivets to work loose.*



**HARNISCHFEGER**  
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# AIRCRAFT PARTS— HANDLE WITH CARE!

**Part for part**, one of today's turbo-prop or pure jet transports represents an investment that would have bought an entire fleet of planes a few years ago. Overhaul and maintenance procedures for these planes include extra-careful, jet-age methods for quick, safe, reliable handling of every airframe or power-plant part.

Northwest Orient Airlines' new maintenance center is equipped with P&H Balanced Design Hevi-Lift hoists in every department. These hoists provide the right combination of smooth lifting power plus precision spotting control to handle aircraft components with maximum care and minimum effort.

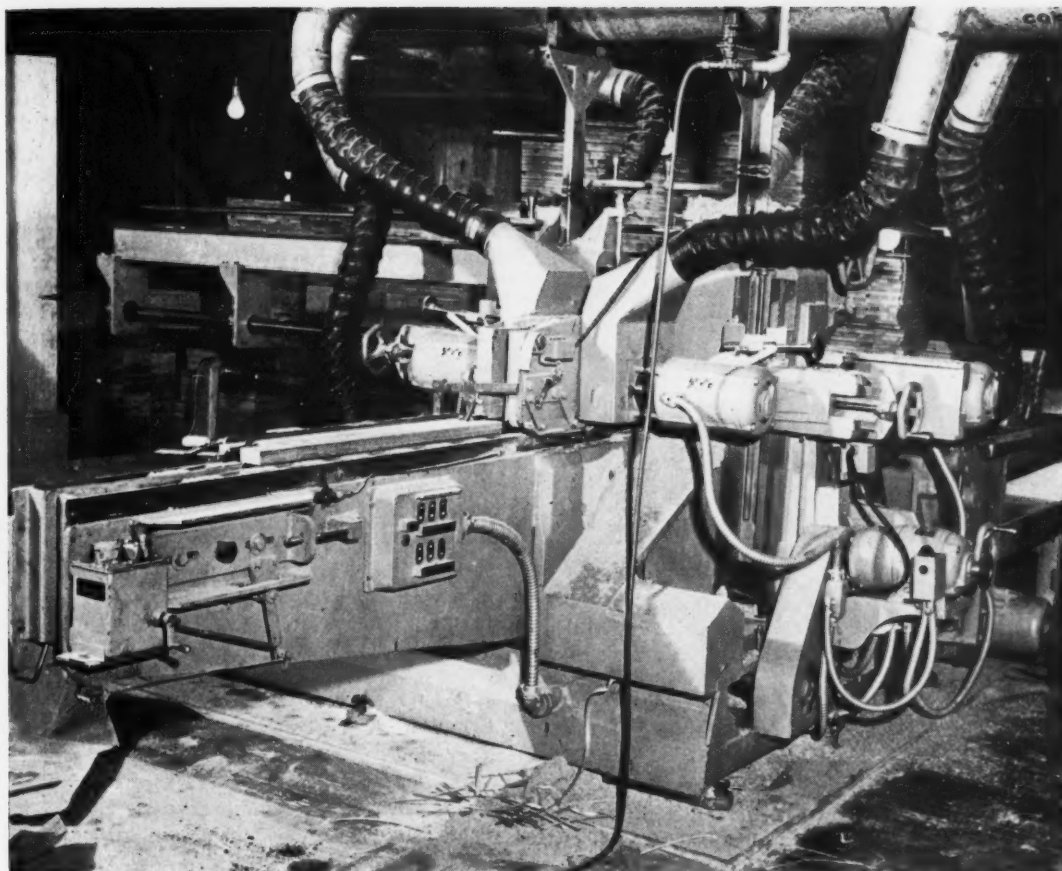
What's more, every P&H hoist in this most modern shop is equipped with the new P&H Pull-A-Hoist — a separate motor-driven tractor unit that provides smooth rolling power and precision positioning of each hoist at the touch of a button. No more lost time tugging or lugging of parts for Northwest's busy mechanics and maintenance specialists!

Bulletin H-63 gives you the complete data about the P&H Pull-A-Hoist — America's newest, most efficient hoist-tractor. Write Dept. 229, Harnischfeger Corp., Milwaukee 46, Wisconsin, today!

*Photo courtesy Northwest Orient  
Airlines, St. Paul, Minnesota.*

**P&H**  
ELECTRIC  
HOISTS

**HARNISCHFEGER**  
Milwaukee 46, Wisconsin



*SAWDUST and small wood shavings are being removed by this dust collection system. Note use of Flexible Tubing Corp.'s Spiratube tubing on ducts leading to machine.*

low and units are suitable in areas with abundant water and no problems with disposal of run-off waters. Use depends on types of dust to be collected and whether dust will wet easily. Wet collection involves corrosion in some cases, and therefore, collectors are often constructed from wood or resistant alloys. Especially suitable in milder Western climates, where freeze conditions are rare, wet collectors work well on fine materials and can be used to precipitate undesirable fumes.

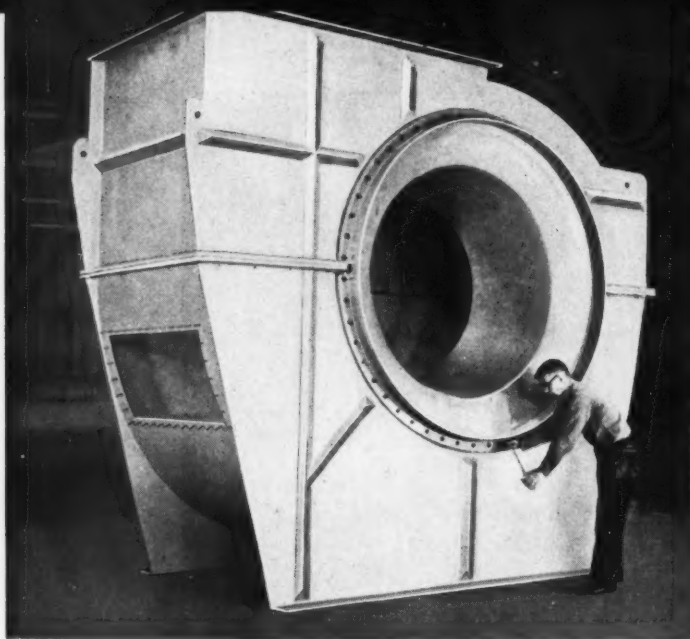
**ELECTROSTATIC PRECIPITATORS**—Device uses high voltage electric charges to precipitate suspended particles from a gas stream. Precipitator generally consists of a series of parallel, flat, grounded plates, approximately nine inches apart. These form ducts through which dust laden gases must pass. In the center of the ducts, insulated from the plates, is a series of fine wires forming a discharge electrode system. By introduction of converted line voltage current to the system, ionization takes place in the vicinity of the discharge electrode and this is transmitted to passing dust particles, which then migrate to the grounded plates. Plates are shaken periodically and the dust drops down into a hopper. Systems can be

designed for high efficiency, 95% and above. They will operate in a wide range of temperature and gas conditions in volumes generally in excess of 30,000 cfm. Relatively high initial cost generally restricts use to large volume industry.

An example of electrostatic precipitation is found on the cover of **WESTERN INDUSTRY** this month. Here precipitators are hooked up at Bethlehem Steel Co.'s Vernon, California plant to clean the hot gases that are emitted from electric furnaces. Gases leave the furnaces and go through a spray chamber which reduces the heat and flame. They enter the chamber at 750 degrees F. and leave it at 180 degrees F. The gases then pass through the electrostatic precipitators made by Western Precipitation Division, Joy Manufacturing Co. These are of the Cottrell design, and operate by ionizing dust, grit and particulate matter that floats in hot air. When particles are ionized they are attracted to electrically charged plates in the smokestack. Dust sticks to the plates, which are cleaned by agitation, the dust falling into a hopper. The device is said to be 92% to 95% efficient.

According to the Air Pollution Foundation, a non-profit scientific research organization committed to impartial fact finding and located in San Marino,





*LARGE FAN HOUSING of Rigidon plastic made by Heil is 11-ft., 3-in. by 5-ft., 4-in. wide and 11-ft., 3-in. high to handle 60,000 C.F.M. of sulphuric acid fumes.*

California, the equipment used for control of different kinds of pollutants is as follows:

"Fumes are controlled by baghouses, electrical precipitators, and sulfur recovery plants; dust emissions by baghouses, centrifugal air separators, electrical precipitators, catalytic combustion, and good firing practices.

"Nitrogen oxides formed in chemical manufacturing operations are controlled by bubble towers, spray towers, Venturi scrubbers and catalysts; those formed by combustion are controlled to a lesser extent by certain catalysts. Sulfur dioxide in high concentrations is controlled by sulfur recovery plants, but in low concentrations no feasible control method is yet available. Carbon monoxide is controlled by oxidizing it to carbon dioxide, and by scrubbing. Hydrocarbons are controlled by floating roofs on storage tanks, vapor recovery systems, venting to smokeless flares, direct-flame burning, and catalytic oxidation; aldehydes by liquid scrubbing, activated charcoal absorption, and fume burners; acids by water scrubbers."

In-plant air cleaning, as considered here, is not concerned with the heating or cooling of a plant's air but merely with the removal of pollutants. This is accomplished by plant ventilating systems which constantly remove huge quantities of air, replacing it with cleaner air. It is also done by exhaust systems that control a special situation or situations. Equipment, such as a plating tank, often requires a special exhaust system. Many of these special exhaust systems are complex, as in the case where a number of dry grinding machines are each provided with a small duct leading off the main duct. This removes much of the dust and grit by vacuum at the point of origin before it has a chance to pollute the plant air. In-plant air cleaning equipment as considered here, therefore, includes such

items as fans, blowers, housings, hoods, and ducts.

Selection of this type of equipment is a highly technical matter. An exhaust system requires expert designing based on the proper rate of removal and the most economical system for handling the polluted air. Initial cost of equipment should be balanced with maintenance or replacement and operating costs before a good system can be determined. One serious error can be the improper selection of materials of construction of the components of the system.

Common construction materials for exhaust systems include: sheet steel, galvanized sheet steel, coated sheet steel, rubber or vinyl lined sheet steel, stainless steel and other alloys such as monel, solid plastic, and wood, stoneware and other non-metallic materials. Installations must be considered, not only from a cost/weight standpoint, but also as to the life of the material. Since many exhaust systems deal with corrosive fumes, the life of the material used, is important.

A Western plant that installed an exhaust system for sulphuric acid discovered that even though the fan housings in the blower system were rubber lined, acid fumes were eating through them. The problem was solved by installing Heil plastic housings.

Plastics are a newer development in this field and are finding increased usage. Not only are they being employed for duct work but they are also used for hoods, fan housings, fans, and smoke stacks.

Despite the fact that general ventilating systems, such as that in use at Hewlett-Packard which filters the air with an electrostatic precipitator and hooded exhaust systems are used, there are occasions when plant air is not clean enough. In the West especially, "clean rooms" are being constructed for use in assembling highly precise and delicate parts. Many of these parts are for the missile industry, and even a speck of dust will seriously interfere with their correct operation.

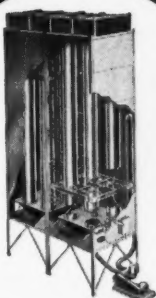
Industry in the West has, with few exceptions, long realized the need for effective air cleaning inside the plant. It has done an excellent job with exhaust and ventilating systems that protect the worker and guard the equipment and products being manufactured from contamination.

One finds in the area of air pollution also numerous instances where industry has anticipated the need for air pollution equipment and is installing it even when no controls are in effect. In other cases industrial firms have installed equipment operating well above the levels required by existing controls. In the State of Washington air pollution men have been impressed by the manner in which a number of industrial plants have on their own initiative gone to considerable expense to install air pollution equipment.

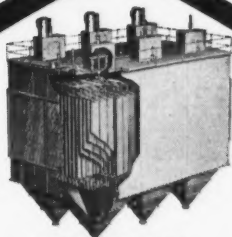
It is true that most of the firms making these installations are larger companies. However, when one considers the expense of air pollution equipment, it would be particularly difficult for small firms to do this.

There seems to be, however, an increasing awareness on the part of industry in the West concerning air pollution and a corresponding desire to do something about it. While this trend is still limited it is nevertheless apparent.

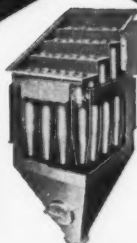




**JET-CLEANED  
FILTER**  
("Dualaire")



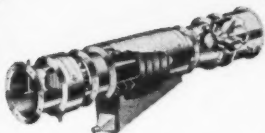
**PRECIPITATOR**  
("Cottrell" Electrostatic)



**CYCLONE**  
("Multiclone" Collector)



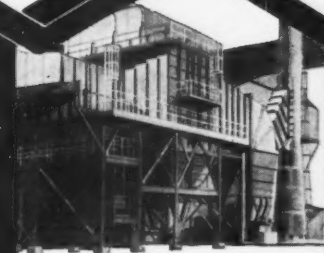
**HI-TEMP FILTER**  
("Therm-O-Flex")



**JET-WHIRL SCRUBBER**  
("Joy Microdyne")



**DEEP-BATH SCRUBBER**  
("Turbulaire-Doyle")



**COMBINATION**  
("Cottrell-Multiclone" "CMP")

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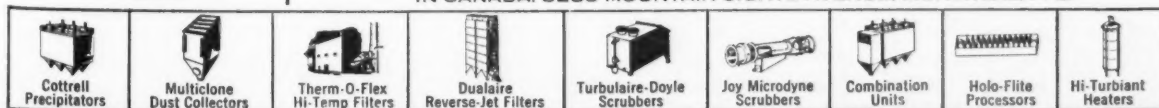


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# HELPFUL LITERATURE

FOR THE WEST'S PLANT OPERATING EXECUTIVES

FOR YOUR FREE COPY CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, P. 68

## CENTRIFUGAL-PRIMING PUMP

A new motor pump designed for petroleum products handling is described in this bulletin. Discusses unique features of the pump which combines a vane-type priming pump with a conventional high-efficiency centrifugal pump to get the advantages of both. Includes dimensions and technical data. *Ingersoll-Rand Co.*

... FOR YOUR COPY, CIRCLE NO. 100

## DIFFUSION COATINGS

Newly developed tough, oxidation-resistant surfaces for metal parts subjected to high temperatures are the subject of this brochure. Describes the diffusion coatings, mechanical properties and discusses the many common engineering metals and alloys that can be protected with the new coatings. *Haynes Stellite Co., Div. Union Carbide Corp.*

... FOR YOUR COPY, CIRCLE NO. 101

## ASBESTOS-CEMENT PRESSURE PIPE

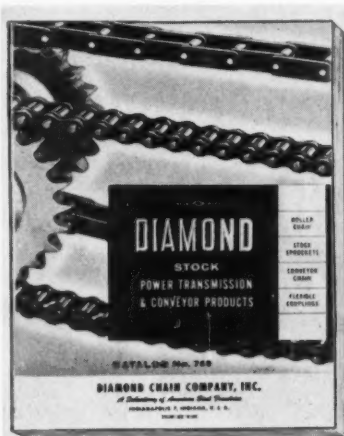
Product features and physical details of asbestos-cement pressure pipe for water systems are set forth in this booklet. Highlights installation and maintenance economies possible with the pressure pipe. Includes table of inside and outside diameter, wall thickness and approximate weight per foot for standard sizes and classes of the pipe. *Keasbey & Mattison Co.*

... FOR YOUR COPY, CIRCLE NO. 102

## CUSTOM ALLOY STEEL CASTINGS

Catalog contains technical data regarding heat, corrosion, and abrasion resistant alloy steels. Charts listing nearly half of firm's more than 100 available cast alloys are included. Describes casting methods. Booklet is of special value to process and manufacturing industries primarily interested in low and high alloy and stainless steel castings. *Esco Corp.*

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## NEW ROLLER CHAIN HP RATINGS

New stock roller chain, sprocket and coupling catalog includes new horsepower ratings developed by Association of Roller and Silent Chain Manufacturers. The new ratings enable design engineers to use roller chain in a broader range of applications. *Diamond Chain Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 104

## EXTRUDED RECTANGLES

Twenty-two new stock sizes of extruded rectangles are included in revised bulletin describing line of rectangles for severe wear and abrasion applications. Lists physical properties, lengths and tolerances and typical uses of the rectangles which are offered in two alloys. *Ampco Metal, Inc.*

... FOR YOUR COPY, CIRCLE NO. 105

## SAFETY CHECK FOR BATTERIES

A listing of 18 common sense suggestions for users of industrial batteries in electric trucks to prevent injuries to personnel and damage to batteries and equipment. Bulletin sets forth the suggestions and explains the reason for the suggestion. *Gould-National Batteries, Inc.*

... FOR YOUR COPY, CIRCLE NO. 106

## HORIZONTAL DRUM STEAM BOILER

An improved horizontal drum steam boiler for dry cleaning, tire recapping and many other industrial and commercial uses is described in this bulletin. Discusses high efficiency water tube design that gives full steam pressure in 10 minutes and other features of the packaged unit. *Sid E. Parker Boiler Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 107

## CONVERSION RELAY KITS

Booklet describes a system of color-selective relay conversion kits together with an information chart. Color-location diagrams on the chart indicate where the kits may be applied on various basic relay designs. Explains how users can thus modify standard types of relays to meet virtually any switching-circuit control requirement. *Clark Controller Co.*

... FOR YOUR COPY, CIRCLE NO. 108

## DEPOSITED CARBON RESISTORS

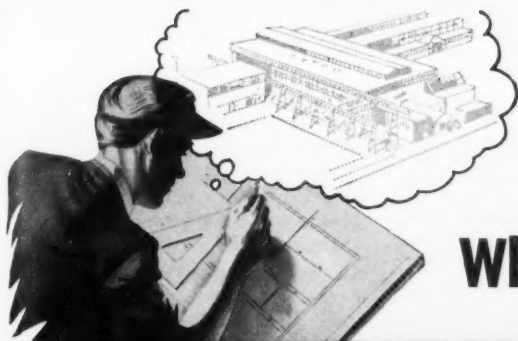
The performance and reliability of molded deposited carbon resistors is the subject of this 28-page study. Charts and diagrams show such variables as temperature cycle, short time overload, terminal strength, dry and wet dielectric strength, moisture resistance and load life. A section deals with resistor selection and equipment design. *International Resistance Co.*

... FOR YOUR COPY, CIRCLE NO. 109

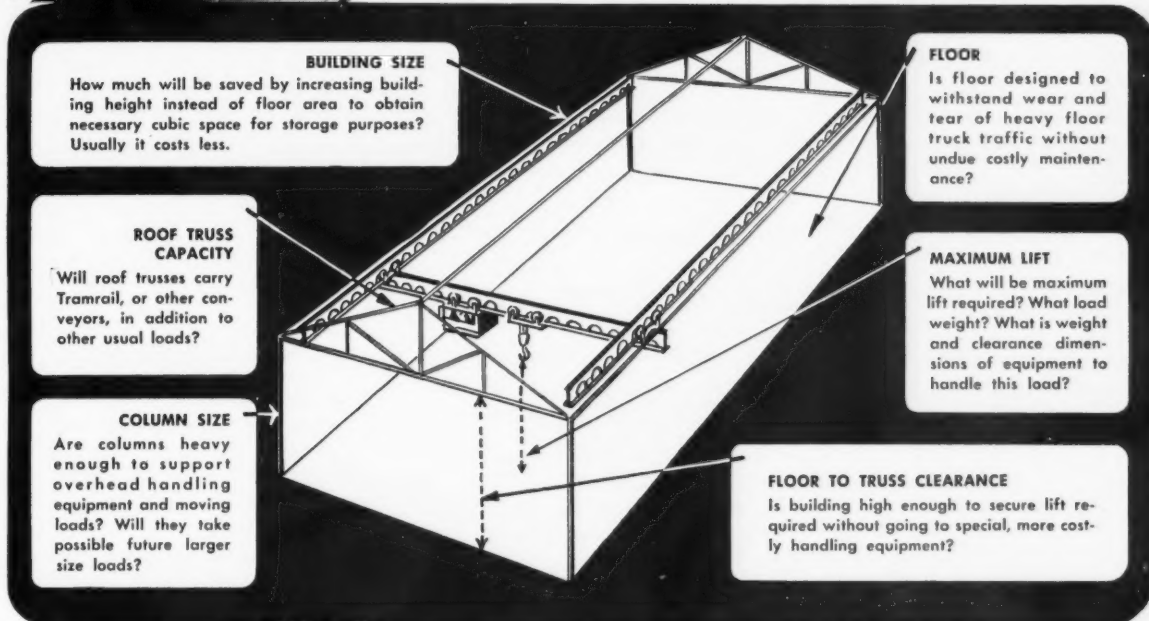
## TEFLON HOSE ASSEMBLIES

A new general purpose hose of teflon with reusable type fittings for industrial uses is the subject of this bulletin. Explains how the hose and reusable fittings can be made up into assemblies on the job with ordinary hand tools. Covers construction, properties, full engineering data and assembly instructions. *Anaconda Metal Hose Div., Anaconda American Brass Co.*

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# Don't Forget Materials Handling When Designing the Building



The foremost demand of a new factory building, whether for production or storage, is that its design and construction aid overall operating efficiency to the utmost. Thus, the building becomes more than just an enclosure, but is actually a vital part of the manufacturing process.

It is, therefore, imperative that the various steps entering into the making of an item be thoroughly considered when the building is designed. One of the most important of these concerns materials handling because this item often amounts from 25% to 50% of the total production cost, and, also, because it is plant-wise in nature.

Regardless of what handling methods are deemed best, overhead cranes or Tramrail, roller or chain conveyors, floor trucks, etc., the building design, size and construction usually has a tremendous bearing on the ultimate handling efficiency secured. Building clearances, floor construction, column locations, aisleway allowances and other factors must be considered for the different handling methods for most satisfactory results.

For initial economy in installation, for most satisfactory operation and highest efficiency, plan for materials handling when you design the building. **Do not make materials handling an afterthought.**



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## OVERHEAD MATERIALS HANDLING EQUIPMENT

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## LITERATURE ADVERTISED IN THIS ISSUE

**Conveyor chain attachments** made to order. 100 page catalog. *Acme Chain Co.*  
Page 34 Circle No. 14

**New steel building** sizes, designs and special features. *Armco Drainage & Metal Products, Inc.*  
Page 5 Circle No. 3

**Expedite maintenance jobs** with all purpose bonding kit of epoxy adhesives. *Adhesive Engineering.*  
Page 61 Circle No. 37

**Herc-Alloy sling chain** booklet on selection, care, use and inspection. *Columbus McKinnon Chain Div.*  
Page 60 Circle No. 36

**No-stretch belting**, oil and grease resistant. *R. & J. Dick Co., Inc.*  
Page 58 Circle No. 34

**Lubricants** to improve machinery operation, reduce maintenance costs. *Fiske Brothers Refining Co., Lubriplate Div.*  
Page 56 Circle No. 31

**Power transmission** products, four bulletins on Steelflex couplings, speed reducers, motor reducers and shaft mounted drives. *Falk Corp.*  
Page 3 Circle No. 2

**Foundry machinery**, a complete line. *Fernholtz Machinery Co.*  
Page 54 Circle No. 29

**Pull-A-Hoist** bulletin describes newly developed hoist-tractor. *Harnischfeger Corp.*  
Page Circle No.

**Cranes**, job-engineered to keep operating costs at a minimum. *Harnischfeger Corp.*  
Page 37 Circle No. 17

**Tractor-shovel** with a no-spill bucket for efficient materials moving. *Frank G. Hough Co.*  
Page 73 Circle No. 48

**Rubber-tired Payloader** units for material handling. Data on available models. *Frank G. Hough Co.*  
Page 73 Circle No. 49

**Fume scrubbers** of Rigidon plastic or lined steel. Full data. *Heil Process Equipment Corp.*  
Page 57 Circle No. 32

**Conveyors**, apron type, vibrating, spiral and belt. *Jeffrey Mfg. Co.*  
Page 7 Circle No. 5

**Material Handling Institute** Pacific Coast Show, Feb. 22-24, San Francisco Cow Palace. Show information. Cover 2 Circle No. 1

**Interchangeable coupling** bulletin. *Perfecting Service Co.*  
Page 48 Circle No. 24

**Non-clog pumps** and condensate and boiler feed units described in bulletins. *Pacific Pumping Co.*  
Page 45 Circle No. 21

**Illustrated catalog** to help solve mechanical packing problems. *Searle Leather & Packing Co.*  
Page 58 Circle No. 33

**Industrial glove** brochure of sizes, types, materials. *Surety Rubber Co.*  
Page 62 Circle No. 38

**All-Wrench tool set** cuts maintenance time. Wrench catalog. *Snap-on Tools.*  
Page 63 Circle No. 40

**Winding equipment** and tools to increase electrical-electronic production. *Tri-State Supply Corps.*  
Page 64 Circle No. 41

**Flexible connectors**, descriptive literature. *Universal Metal Hose Co.*  
Page 53 Circle No. 28

**Combination welding** and cutting units. Helpful literature. *Victor Equipment Co.*  
Page 13 Circle No. 8

**Weatherproofing products** for roofs, floors. Manual. *Pioneer Div., Flintkote Co.*  
Page 77 Circle No. 51

### SHEAVE STANDARDIZATION

This standardized quick-demountable sheave specification guide reflects the sheave simplification program recently adopted by the Multiple V-Belt Drive and Mechanical Power Transmission Association and Rubber Manufacturers' Association. Booklet gives dimensions and weights of 410 stock sheave sizes. *Fort Worth Steel & Machinery Co.*

... FOR YOUR COPY, CIRCLE NO. 111

### BUILT-UP ROOFING MANUAL

Complete specifications for constructing a built-up water-tight roof are contained in this specification manual. Includes instructions on materials and methods for installations on both flat decks and steep roofs and on all types of surfaces. Re-roofing, insulation, flashings, waterproofing and dampproofing are also covered. *Koppers Co.*

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### NEW PLYWOOD STANDARDS

A new commercial standard for Douglas fir plywood, expanded in some areas to take advantage of recent scientific advances and revised in others to clarify meanings, has been put into effect. The new standard, which applies to all fir plywood produced since November 14, is reprinted in this 19-page booklet. *Douglas Fir Plywood Association*

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### PLASTIC, CHEMICAL MATERIALS

Brochure describes complete line of polycarbonate resins, phenolic resins, varnishes and molding powders, and fused magnesium oxide. Covers product features, applications and detailed technical data. Specially compiled as an aid to designers, molders, fabricators, formulators and end-users. *Chemical Materials Dept., General Electric Co.*

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### COMPRESSION STRAPPING

Specifications of 14 models of compression strapping machines are detailed in this brochure. Discusses advantages of compression equipment. Charts power requirements, critical dimensions, platen openings and other factors affecting model selection. Includes application photos and describes optional accessories. *Signode Steel Strapping Co.*

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### REDUCING HANDLING COSTS

Eighteen ways to cut material handling costs are illustrated with application photographs and information on the equipment used in this new bulletin. Problems involving the positioning of goods for order selection, the handling of materials on pallets, the moving of goods between floors and accumulation of cartons on a conveyor line. *Rapids-Standard Co., Inc.*

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## HEAT-TREATING FACILITIES

Brochure describes company's new continuous controlled atmosphere furnace for heat treating cold-finished bars. Explains how this furnace, and an exclusive Electreat process, provide a full range of heat treating for users of cold finished bars. *Jones & Laughlin Steel Corp.*

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## ALUMINUM VAN

Bulletin describes a new high-volume aluminum van that incorporates special features required to meet the needs of Western truckers. Discusses design features and operating advantages of the new unit and provides illustrations and condensed specifications. *Brown Trailer Div., Clark Equipment Co.*

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## PROPORTIONING SYSTEM

A newly developed proportioning system to pump, meter, transfer, mix and dispense two component, chemically reactive materials is described in this brochure. Explains how the unit works and what it will do including spraying of most epoxies, polyesters and polyurethanes without the use of atomizing air. Complete technical data. *Gray Co., Inc.*

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## FUEL CLEANLINESS GAUGE

Technical brochure discusses a fuel cleanliness gauge for aircraft fuel transfer operations. Describes the various functions of the gauge which include the checking of the full flow of fuel, instantaneous reaction to contamination, and full cut-off of fuel flow that is contaminated above a predetermined level with water or solids. *Bendix Filter Div., Bendix Corp.*

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## REMOVING, PREVENTING RUST

Tested and proved procedures for preventing and removing rust under almost any conditions are detailed in this bulletin. Explains how to remove rust from raw stock; removing rust and grease in one operation; preventing rust while parts are being processed and preparing steel for painting with protection against rust before and after. *Oakite Products, Inc.*

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## BRONZE BUSHINGS

New brochure lists twenty SAE brass and bronze alloys, their chemical composition and physical properties. Includes some of the many applications of the bushings. *Markey Bronze Bushing Co.*

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## GATE VALVE

Brochure is devoted to a new model of union bonnet bronze gate valve. Covers construction, design features; describes three disc types, sizes, ratings and dimensional data in inches, weight, pounds. *Lunkenheimer Co.*

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## AIR-OPERATED "C" CLAMPS

Illustrated bulletin describes line of air-operated "C" clamps. Discusses outstanding features, optional features, specifications of the two series, ordering data and dimensions. *Airmatic Valve, Inc.*

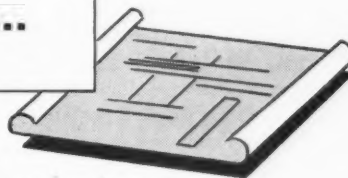
... FOR YOUR COPY, CIRCLE NO. 124

## PLASTIC PRECISION PARTS

Catalog outlines bobbin, washer and precision-made stock parts in company's line. Lists properties of nylon, teflon and epoxy materials, product illustrations and specifications on over 500 parts. *Cosmo Plastics Co.*

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## FULFILLING THE PROMISE...



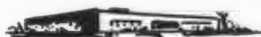
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## STAINLESS FASTENER GUIDE

A question-and-answer guide to industrial applications of stainless steel fasteners. Folder reviews in capsule form the main features of the line. Covers versatility of stainless steel alloys for fastening applications including corrosion resistance, scale resistance, and low temperature usage. *Standard Pressed Steel Co.*

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## PACKAGED LIQUID CHILLER

Bulletin describes and illustrates the standard mechanical and electrical features of a new line of hermetic packaged liquid chillers. Tabulation of net rated capacity is presented along with charted cooler and condenser pressure drops. Includes step-by-step selection procedure. *American Standard Industrial Div.*

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## ALUMINUM HAND TRUCK

Folder is devoted to a line of lightweight aluminum alloy hand trucks. Includes pictures and specifications of models especially designed for easy and efficient handling of all types of materials and for maintenance work. Covers specialized hand trucks and new safety features. *Rol-Away Truck Mfg. Co.*

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## VERSATILE PACKER

Booklet about a newly developed packer that offers repeatable weight accuracy, interchangeable feed and delivery systems and multiple installations. Describes the new packer, versatility features and attachments for packaging powdered, granular, pelletized or flaked materials in value or open-mouth bags or drums. *H. L. Stoker Co.*

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## NICKEL SULFAMATE PLATING

Technical instruction bulletin about nickel sulfamate process, described as the most suitable bath for heavy build-up for metal resizing, electroplating, electroforming and other functional uses. Discusses solution preparation for both still and barrel operations, operating conditions and analytical procedures. *Hanson-Van Winkle Munning Co.*

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## ELECTRODE DATA

Pocket-sized 60-page booklet on line of electrodes outlines outstanding advantages of each electrode. Includes full description and application, chemical properties, conformances and approvals, packaging and stocking. Also hints on how to get the most from the electrodes. *Westinghouse Electric Corp., Welding Div.*

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## 17-INCH DRILL PRESSES

Bulletin is devoted to a line of 17-inch drill presses featuring an all new, up-front power feed operated with only one hand. Explains advantages of the new line which is available in 76 models, designed for both production and shop work. Includes specifications and dimensional data. *Rockwell Mfg. Co., Power Tool Div.*

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## ACTUATION PROBLEMS

This engineering data book covers basic principles, types and applications of ball bearing screws and splines. Also contains design data, sample problems, and information on lubrication, size ranges, critical speeds, finishes available, and mounting methods. *Saginaw Steering Gear Div., General Motors Corp.*

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## STORAGE PLANNING GUIDE

Handy little pocket-size booklet is devoted to simplified principles of materials storage planning. Contents include the need for better storage, outline of planning fundamentals, principles of adjustable racking, typical installations, storage planning detailer and a layout grid. *Sturdi-Bilt, Material Handling Div., Union Asbestos & Rubber Co.*

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## REINFORCED PLASTIC MOLDING

The six basic techniques used by the reinforced plastics industry to mold thousands of products are explained in this booklet. Lists specific advantages and applications of each technique. Also gives physical and chemical properties of parts molded by each method. *Reinforced Plastics Div., Society of the Plastics Industry, Inc.*

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## ABRASIVE CUT-OFF WHEELS

Regular resinoid bonded abrasive cut-off wheels are the subject of this bulletin. Information is presented about production cutting use, as well as general use in toolrooms and machine shops. Recommended grain and grade specifications for various materials are included. *Simonds Abrasive Co.*

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## REFRACTORIES FOR OIL INDUSTRY

Brochure describes properties of various monolithic refractories, refractory brick and shapes, mortars and granular materials, and insulating refractories which are used in petroleum refining and petrochemical industries. Includes tabular data on castable refractories. *Harbison-Walker Refractories Co.*

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## OVERHEAD HANDLING DATA

Booklet of engineering and application data contains helpful up-to-date information on various types of carriers, cranes, tractors, track switches, grabs and electrification. Includes detailed studies of track design, peening and stresses. Photos show a wide variety of installations. *Cleveland Crane & Engineering Co.*

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## SILICONE COATINGS FOR PAPER

Publication deals with a description of various applications of silicone release coatings as well as the chemistry of these materials. The main types of silicone release coatings are discussed and some new light is shed on why silicones give outstanding release properties. Contains photos, tables and charts. *General Electric Co., Silicone Products Dept.*

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## POWER TOOL CATALOG

Newly revised 92-page catalog of complete line of industrial power tools and accessories. Includes specifications, listings and descriptions of accessories for all tools; action photos and drawings supplement the text. Describes new tools designed to broaden production-line applications. *Rockwell Mfg. Co., Delta Power Tool Div.*

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## SLINGS WITH BUILT-IN SAFETY

Bulletin about a new device, a sling check gauge, which operates very simply and shows when a sling is overloaded. Includes chain sizes, material sizes, inside dimensions and working load limits. Also describes innovations for checking elongation and instructing personnel. *Campbell Chain Co.*

... FOR YOUR COPY, CIRCLE NO. 141

## CONTROLS AND EQUIPMENT

Profusely illustrated, condensed catalog of pneumatic and hydraulic controls and equipment. Contains descriptive details on line of valves, cylinders, filters, lubricators, pumps, motors, accumulators, power units and other industrial and mobile equipment. *Rucker Co.*

... FOR YOUR COPY, CIRCLE NO. 142

## CRYOGENIC INSULATION

A specially processed mineral wool fiber insulation for cryogenic applications is described in this bulletin. Lists the forms, uses and advantages of the material, physical properties and includes a chart of thermal conductivity at mean temperatures from minus 100 to plus 600 degrees F. *Johns-Manville Corp.*

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## INDUSTRIAL WATER HEATING

Cost-saving ideas on industrial water heating installations, estimating hot water requirements for various industrial purposes, complete sizing data and installation instructions for water heating systems are contained in this 100-page manual. Includes specifications on heater models and a full range of application ideas. *A. O. Smith Corp., Permaglas Div.*

... FOR YOUR COPY, CIRCLE NO. 144

## FLAME-CUTTING MACHINES

Machines covered in this new catalog range in size from small, handy portables that can be carried around a shop by one man to huge multi-torch shape-cutting machines capable of reproducing tens or thousands of the most intricate shapes and patterns in steel. Describes new photocell tracer. Includes complete specifications for each machine and typical installations. *Linde Co., Div. of Union Carbide Corp.*

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## PROTECTIVE COATINGS

The solution to a wide variety of corrosion and deterioration problems is presented in this booklet. In addition to covering the properties and specification data on nine major protective coatings, the brochure lists scores of typical installations requiring protection along with the recommended coating to assure lasting protection. *Koppers Co., Inc., Tar Products Div.*

... FOR YOUR COPY, CIRCLE NO. 146

## GATING ZINC DIE CASTINGS

Techniques of gating zinc die castings of various shapes, sizes and dimensions are detailed in this 48-page booklet which contains many line diagrams and photo illustrations. Also covers multiple cavity arrangements, runner and sprue details, overflow well details and gating and die temperature. Methods to avoid soldering of the die are outlined. *American Smelting and Refining Co.*

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# PACIFIC

## Features PUMPS FOR INDUSTRY

### NON-CLOG PUMPS

THOUSANDS OF PACIFIC NON-CLOG pump installations handle industrial wastes, heavy fluids, liquids containing solids, refuse and pulp. Available in special metals for handling products of canneries, breweries, food, and other processing plants. Send for Bulletins 1850 series.

### CONDENSATE AND BOILER FEED UNITS

WIDE RANGE OF SIZES AND TYPES conform to latest ASVNE recommendations, for vertical, elevated or floor level installation. ReturnZall package units (illustrated) are complete package units, with square cast-iron receiver, bronze fitted centrifugal pumps (type GR), standard heavy-duty NEMA motor and float controls. For complete information send for Series 1700 bulletins.

### OTHER PACIFIC INDUSTRIAL PUMPS

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- Circulators
- Fire pumps
- Proportioning pumps
- Horizontally split case centrifugal pumps
- Contractors' self priming pumps
- Diaphragm pumps
- Centrifugal pumps
- PACO Turbine-type pumps
- Rotary pumps



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## SPECIAL MANUALS

FOR YOUR FREE COPY, CIRCLE APPROPRIATE KEY NUMBERS ON POSTCARD, p. 68

### AIR POLLUTION CONTROL EQUIPMENT

EVERY METROPOLITAN AREA in the West is aware of the problem of air pollution. Some areas have instituted rigid controls; some are in the process of doing so; and others are sampling the air and making tests. Air pollution control is coming throughout the West, and industrial firms, if they have not already done so, will be required to install air pollution equipment where needed.

Air pollution equipment is expensive and its selection and installation of a highly technical nature. If your firm is among those that will have to install this equipment, it is to your advantage that you know as much as possible about the different types offered and the variations within these types. For this reason the Editors of WESTERN INDUSTRY have compiled a list of current manuals of air pollution equipment. We urge you to take advantage of it. Experiences of firms in the Los Angeles area show that this equipment and its installation often costs 10% of total plant cost and can run as high as 20%.

#### Dust Collection and Recovery Systems

Electric precipitators, mechanical and fly ash collectors, automatic and standard dust arrestors and exhaust fans which make up this firm's line of dust collection systems are outlined and described in this bulletin. Discusses features, operation and engineering service. *Buell Engineering Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 200

#### Air Filtration

Catalog covers filters that are resistant to temperatures up to 1600 degrees F with less than .05% loss in efficiency and others having somewhat less efficiency that can be used up to 2300 degrees F. Booklet opens with a thorough discussion on planning the system and gives complete technical data on various kinds of filters and an air purification unit. *Flanders Filters Inc.*

... FOR YOUR COPY, CIRCLE NO. 201

#### Air Washers

Air washers that clean, cool, humidify and dehumidify the air as needed are the subject of this brochure. Explains principle of operation, construction, installation, general data and dimensions of various models. *Master Fan Corp.*

... FOR YOUR COPY, CIRCLE NO. 202

#### Controlling Industrial Dust and Fumes

General catalog covers line of dust and fume control equipment for the process industries. Describes electrical precipitators, mechanical collectors, combination units, jet-cleaned filters, hi-temp filters, scrubbers, processors and heaters. *Western Precipitation, Div. of Joy Mfg. Co.*

... FOR YOUR COPY, CIRCLE NO. 203

#### Blowers, Exhausters For Air or Gas

Bulletin covers types of air blowers and exhausters available in line including heavy duty cast and heavy duty fabricated. Lists typical applications, general specifications, operating features and capacities. Outlines fundamental engineering laws for blower applications. *Lamson Corp., Billmyre Blower Div.*

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#### Propeller Fans

Catalog covers line of propeller fans for economical handling of air at low and intermediate pressures. Covers design, five important features, selection, installation, and charts capacities, dimensions and specifications. *Trane Co.*

... FOR YOUR COPY, CIRCLE NO. 205

#### Industrial Dust Control

Bulletin devoted to dust control equipment for power plants, steel production, cement and aggregate production, chemical and petroleum processing, food and grain processing and general manufacturing. Discusses operating characteristics, construction features and contains engineering data. *American-Standard*

... FOR YOUR COPY, CIRCLE NO. 206

#### Dust Collector

A general purpose dust collecting unit for protection of both man and machine is described in this bulletin. Discusses uses including adaptation to many kinds of wood and metalworking machines such as disc sanders; circular and band saws; belt and surface grinders; polishing lathes; small sand blast units and many other applications. *Max Mfg. Co.*

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### Electronic Air Cleaners

Brochure explains how electronic air cleaner works and advantages of use in less depreciation, soiling, smoke, cleaning and maintenance. Charts dimension details of nine models to fit any type of installation. *Trion, Inc.*

... FOR YOUR COPY, CIRCLE NO. 208

### Air Conditioning, Heating and Ventilating Units

Bulletin about a line of air conditioning, heating and ventilating central station units, from 400 to 30,000 cfm. Presents sizing data on graphs. Discusses features; includes dimensions and specifications. *Airtherm Mfg. Co.*

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### Plastic Ventilation Products

Data in this bulletin covers principally a glass reinforced plastic fabrication, Rigidon, and its properties that make it an effective material for ventilating hoods, ducts, fans, fume scrubbers, tanks, tank guards, and other applications. *Wooldridge Co.*

... FOR YOUR COPY, CIRCLE NO. 210

### Power Roof Ventilators

Two basic designs in power roof ventilators, a straight-through type and a dome-type, are discussed in this brochure. Standard and optional features are explained. Includes tables of sizes, dimensions and performance data. *L. J. Wing Mfg. Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 211

### Fume Exhauster

A portable fume exhausting system especially designed to exhaust fumes from welding, soldering and brazing operations is the subject of this bulletin. Discusses operation, features and other uses for the unit. *Cincinnati Fan & Ventilator Co.*

... FOR YOUR COPY, CIRCLE NO. 212

### Industrial Incinerators

A line of smokeless-odorless incinerators for heavy-duty use in commercial and industrial installations is described in this catalog. Included are custom-built models, portable models and pre-fabricated chimneys with complete specifications. *Winnen Incinerator Co.*

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### Air Sampler

Brochure about an air sampler that has been improved to provide constant sampling rates that satisfy even the most exacting tolerances. Discusses construction, operation and recommended applications including explosion hazard environments. *Union Industrial Equipment Corp.*

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### Vapor Recovery Systems

Brochure describes a new, patented process for the recovery of usable solvent from vapors usually lost during degreasing and cleaning operations. Discusses savings in solvent costs as well as removal of undesirable solvent vapors from the atmosphere. *Vic Mfg. Co.*

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## NEW PROVEN

Genie-Air Industrial Ventilating Unit

REDUCES HEATING COSTS UP TO **45%**

### Unique New Engineering Principle

PROVIDES YEAR 'ROUND CONTROLLED VENTILATION



The GENIE-AIR INDUSTRIAL VENTILATING UNIT materially reduces initial equipment and operating costs by driving the wasted heat under the roof line back to the floor area. MODEL ER is a dual purpose, power-driven ventilator that provides either recirculation of air within the building or exhaust. A 3 position reversing switch controls the direction of the fan. On the RECIRCULATING CYCLE, the fan blows the air downward. An exclusive DIVERTCO-DAMPER seals the top of the unit to prevent winter heat loss. Heat trapped under the roof line is pulled into the fan and blown out the diffuser openings at the bottom carrying it back to the floor area. This movement of air keeps temperature more uniform at all levels and improves the efficiency of your heating system. On the EXHAUST CYCLE the fan blows the air upward, pulling hot air into its path and exhausting it outside the building. The exclusive DIVERTCO-DAMPER is lifted up by the air column and its conical shape directs the air movement so that it is easily exhausted without back pressure. The GENIE-AIR DUAL EXHAUSTER-RECIRCULATOR has been proven in industrial installations for over 5 years.

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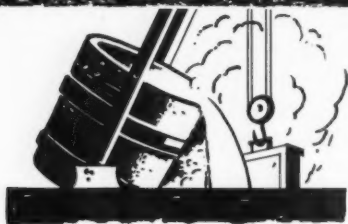
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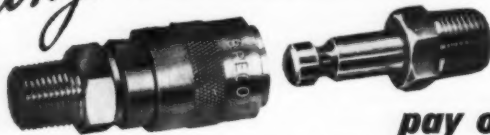
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A simple, one-hand operation—**connect or disconnect lines instantly**. No turning or twisting. Eliminates costly "wrench type" connections. Step-up production.

The Series "D" (2D & 4D) Couplings are **interchangeable** with all popular makes. A small, rugged lightweight coupling for air, liquids and gases. Designed for instrumentation, aircraft and industrial uses. Construction and performance meets Military Specification MIL-C-4109A.

Patented **PUSHOMATIC** locking forms a positive high-pressure and leak-proof connection. Buna N seals assure positive sealing. Shut-off valve in socket stops the flow when disconnected. Working Pressures to 7500 PSI.

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<b>One-hand Operation</b>	<b>Integral shut-off valve</b>
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Four end types in pipe sizes 1/8" through 3/4" N. P. T.  
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48

## Air-Exhaust, Recirculation and Supply Systems

A power roof exhauster, a dual exhauster-recirculator and an air supplier are described in this brochure. Explains the particular advantages of each model, construction features, performance and dimensional data. Lists points to consider in selection of equipment. *Genie-Air Products*

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## Air Moving Equipment

Standard and custom industrial air-moving equipment is the subject of this bulletin. Describes custom built fans ready for service. Includes application photos of heavy duty fans at work in various industries and illustrates line of man cooling fans and wall type ventilating fans. *Robinson Ventilating Co.*

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## Electrical Precipitator

Booklet outlines the development and basic steps of electrical precipitation, and then deals in detail with charging, precipitating and discharging the dust particles. Includes a discussion of the back-ionization problem and describes a spark rate unit for its control. Discusses two types of suggested energy sources, silicon and electronic. *Aerotec Industries, Inc.*

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## Electronic Handbook

Manual discusses in detail and answers questions concerning the use of electric and electronic controls in commercial and industrial air conditioning applications. Compares electronic and pneumatic controls. Designed for engineers, contractors, architects and users of automatic controls. *Barber-Colman Co.*

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## Air Conditioning Blowers

Booklet discusses latest developments in modern blower design and construction. Pictures some of the many different types of specialized blowers designed and manufactured for specific applications and covers custom design, field installation assistance and laboratory approval service. *Lau Blower Co.*

... FOR YOUR COPY, CIRCLE NO. 220

## Industrial Dusts

The factors which influence the choice of dust control equipment are discussed in this 28-page booklet. Explains what dust is, technique in the analysis of dust and engineered efficiency. Describes line of equipment and recommended industrial applications. *Wooldridge Co.*

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## Mechanical Draft Fans

Information on a new line of high volume radial tip mechanical draft fans designed for induced draft service in large industrial plants, central power stations, paper mills and sintering plants is contained in this bulletin. Discusses pertinent design features and charts mechanical efficiency. *Chicago Blower Corp.*

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### Electrostatic Precipitators

Reprint of a recent talk on electrostatic precipitators. The paper discusses what the plant engineer should know about the requirements of an electrostatic precipitator for industrial applications. *Buell Engineering Co.*

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### Ventilating Equipment

Manual opens with a discussion of exhaust fans and importance of selection with proper rating for each given application. Describes power roof ventilators for wall or roof mounting, duct fans for paint spray booths, exhaust fans for hazardous location applications, heavy duty industrial man coolers and air circulators. *Diehl Mfg. Co.*

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### Air Purification With Activated Carbon

A complete description of activated carbon air purification equipment is contained in this manual. Explains adsorptive and holding capacities of activated carbon and how, used in combination with air conditioning or ventilating systems, certain air pollution problems are solved. Includes application information, engineering and layout data. *Connor Engineering Corp.*

... FOR YOUR COPY, CIRCLE NO. 225

### Electronic Air Cleaning

Catalog devoted to line of electronic air cleaning units featuring the use of selenium rectifiers, the single, self-adjusting, ballasted circuit and a patented inside curve ionizer. Discusses other features of the units; contains general engineering data on power packs, cells and washing systems, typical wiring diagram, an efficiency chart and suggested specifications. *Electro-Air Cleaner Co., Inc.*

... FOR YOUR COPY, CIRCLE NO. 226

### Central Station Air Conditioning Units

This 60-page book introduces a new line of packaged central station air conditioning units made up of 14 basic sizes with 24 different arrangements available for each size. Covers type of equipment, conditioning requirements, coil performance, humidification, temperature control, air cleanliness, fan and motor requirements and installation data. *American Air Filter Co., Inc.*

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### Dust Collector For Use With Individual Machines

Brochure describes a dust collector for use with individual machines for collecting wood, plastic and metal dust or shavings. Discusses major features of the model, specifications and efficiency of the unit. *Kindt-Collins Co.*

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### Space Saving Fans

An airfoil centrifugal fan with in-line air flow is discussed in this catalog. Includes construction and installation diagrams, performance curves and tables. Covers construction features, optional accessories, installation arrangements, engineering data and recommended applications. *Westinghouse Electric Corp.*

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## One of these sling chains will meet your most exacting needs

**One-day delivery** is forthcoming when you specify ACCOLOY KUPLEX Sling Chains. Made up locally by an authorized KUPLEX distributor, these slings feature matched Accoloy steel components, which have been proof-tested at the factory at twice working load limits. Assembled from Drop-Forged Shaped Masterlink, Kupler and Hook plus Accoloy 125 chain, they're available in six chain sizes ( $\frac{1}{4}$ " to  $\frac{7}{8}$ " in single, 2-leg, 3-leg and 4-leg styles.

**Factory-built** all-welded construction is assured when you buy ACCO Registered Sling Chains. Accoloy 125 chain is welded under scientific control and heat-treated to optimum strength levels. Registration ring and certificate—signed by ACCO—attest to successful test performance of the sling.

See your local distributor for ACCO Registered or ACCOLOY KUPLEX sling chains. If you don't know his name, contact any of the American Chain sales offices listed below for further information.

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# NEW EQUIPMENT

FOR WESTERN PLANT OPERATION, PRODUCTION AND MAINTENANCE



USE RIP OUT POSTCARD, PAGE 68, FOR MORE INFORMATION ON PRODUCTS DESCRIBED

## HAND TRUCK

... standard model for stock checkers



This hand truck is designed to handle a variety of items and parts for stock checkers. It has a writing table and stationary rack welded to the frame. The tubular steel truck handle forms a protective bumper for the stationary rack. The truck is of

all steel welded construction with three steel shelves, which are built with a 1-in. flange all around to prevent materials from falling off. Height is 42½-in. to the top shelf, 50-in. to the writing table. Length of the truck is 44-in. with a floor clearance of 6½-in. Shelves measure 38x20 inches and the writing table is 20-in. wide by 14-in. deep. The truck is equipped with four 6-in. rubber tires, roller bearing casters, two swivel ones at the push handle end and two rigid ones at the other end. *Palmer-Shile Co.*

... FOR MORE DETAILS, CIRCLE NO. 300

## SPRAY EQUIPMENT

... that meters resin or catalyst materials

An improved model of the unit for spray-applying plural component or catalyst materials has been introduced. Called the Formulator "B," it is a significant addition to the plural component spray equipment line introduced early this year. The Formulator "B" accurately meters resin and catalyst materials to a spray gun for instantaneous spray or pour application of fast-reacting materials. The Turbulator gun can be used with it for materials that have extremely fast reaction times. It mixes the two components internally in the gun with a high speed mixing device, and sprays them immediately. Materials with reaction times as short as four seconds have been successfully sprayed, on a continuous basis. A catalyst gun can be used with slower reacting materials, or the standard Model 18 spray painting gun can be used as an injection gun. The new Formulator is all air operated, and will dispense materials from original shipping containers. Foams, Fiberglass reinforced plastics, epoxies, gel-coats, adhesives, and other reactive materials can all be handled by the unit. *Binks Mfg. Co.*

... FOR MORE DETAILS, CIRCLE NO. 301

## STEEL SHELVING

... features locked-door security

New closed ledge-type steel shelving with lockable doors is now available. The new 7-T series units are designed for safe, secure storage of tools, parts, costly materials and merchandise. A waist-high ledge provides a handy working area. Units are 36-in. wide and 89-in. high with a ledge depth of 12-in. Ledge and shelf depths available are 24 and 12-in., 30 and 18-in. and 36 and 24-in. Standard starting sections include seven shelves. Doors are made from heavy gauge steel, reinforced to prevent sagging. Door latches engage at three points for maximum security. Chrome plated door handle has a built-in key lock. A durable oven-baked enamel electrostatically sprayed over a special phosphate undercoat protects the units against corrosion. Standard colors are gray and green. *Alan Wood Steel Co.*

... FOR MORE DETAILS, CIRCLE NO. 302

## POCKET TRANSMITTER

... is completely transistorized

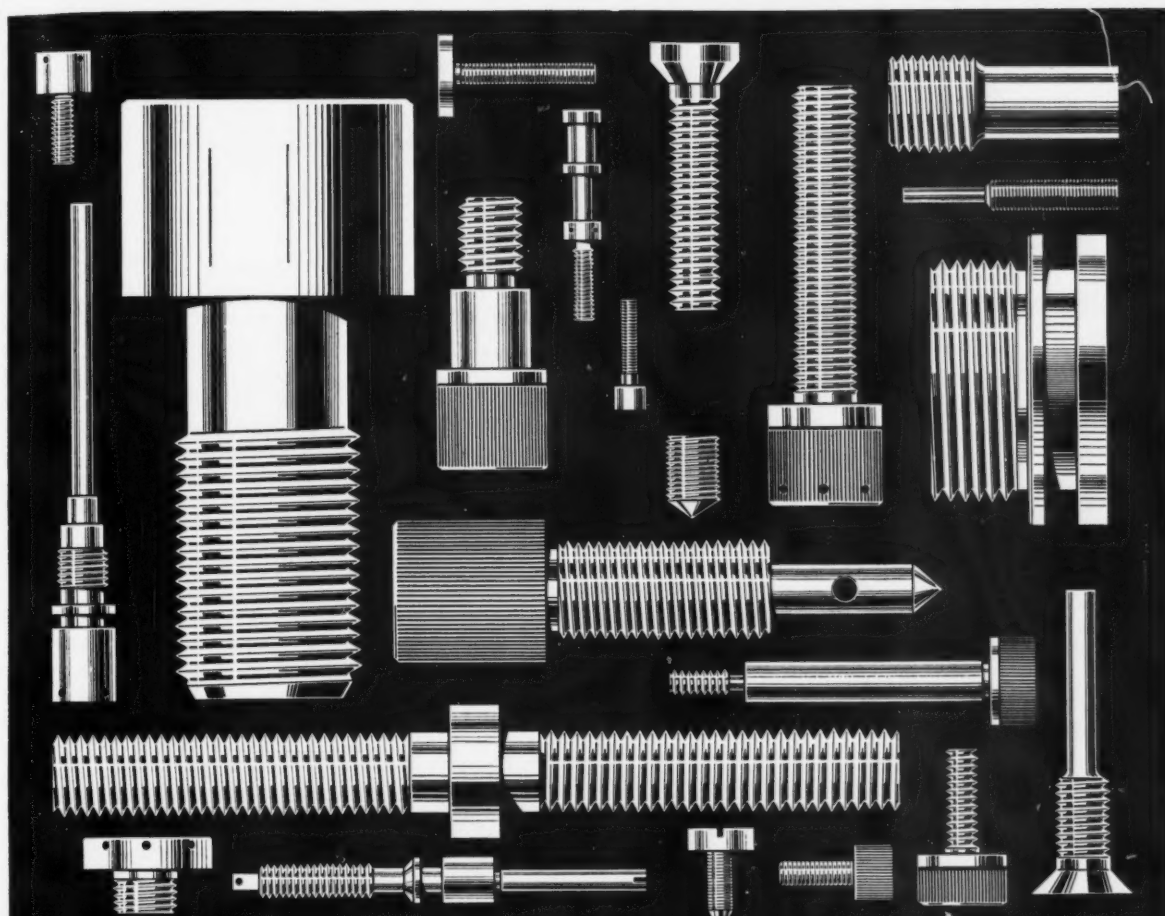


The first fully transistorized FM radio transmitter to operate on standard VHF two-way mobile communications frequencies has been developed. The new unit, called the "Handie - Talkie" Pocket Transmitter, is designed for operation on frequencies

between 25-54 mc and 132-174 mc. It provides 500 milliwatts RF power output. Eleven transistors in the various stages of the unit provide high reliability, low power consumption characteristics and compactness. The pocket transmitter weighs just 44½ ounces, and measures 5½ inches by 2½ inches by 1½ inch. The transmitter is completely self-contained, including microphone, antenna and batteries. Two antennas are available—a solid steel whip and a collapsible whip antenna. The miniature transmitter can be used to communicate with mobile radiophones and/or base stations. It also can serve as a mate to the recently-introduced VHF receiver for providing pocket-sized two-way radio communications. *Motorola*

... FOR MORE DETAILS, CIRCLE NO. 303





## WHEN YOU NEED SPECIAL FASTENERS—

### Here are 4 good reasons for getting them from SPS

**Service you can depend on.** Where socket-type specials are concerned—from extreme configurations to near-standards—you can rely on SPS for prompt quotations, strict quality control during manufacture, and delivery on schedule. The special fasteners you need will be on your assembly line in time . . . and they will fit with precision.

**Experience.** No one has invested more in fastener research and development than SPS. No one has pioneered more breakthroughs—in design (UNBRAKO Hi-Life Thread), performance (first commercial 260,000 psi bolt), or materials (first practical titanium bolt). Because of this experience we are singularly qualified to meet any requirement you may have in precision specials.

**Design confirmation.** SPS does more than simply meet specifications. Our engineering and methods people not only interpret your prints; they also analyze them—carefully. If there is a question (socket depth, fillet radius, etc.), we double check with you. Certainly no one knows all the answers, but sometimes we can offer a sug-

gestion that may help increase fastening reliability and thus increase overall reliability of your finished product.

**Production facilities second to none.** Whatever your requirement in specials, SPS has the facilities to produce it in the quickest, most economical manner. Special configuration, special material, special threads (metric, for example), special plating or surface treatment, special tolerances—we are handling such problems daily on a volume basis. Further, we also supply the special keys needed for installation of non-standard or difficult-to-reach threaded parts.

For more information or service, see your local SPS distributor or contact Standard Pressed Steel Co., SPECIAL INDUSTRIAL FASTENER Division, SPS, JENKINTOWN 47, PA.

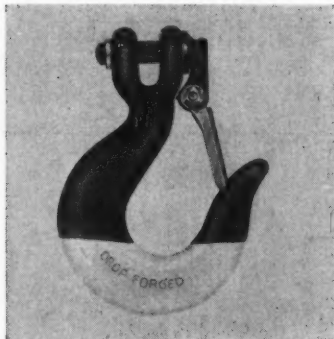
# SPS

*where reliability replaces probability*

... for more details, circle No. 26 on Reader Service Postcard

## SAFETY HOOK

... for sling chain assemblies



A new component for sling chain assemblies has been introduced. Designated the Accoloy Kuplex safety hook with safety latch assembly, it provides for easy assembly to sling chains. Complete chains are now equipped with this new safety type hook and are assembled by the distributor from factory-tested components. Present users of Kuplex slings with sling hooks can convert such hooks to a safety type hook by merely replacing the conventional load pin with the special safety latch assembly available as a separate component. *American Chain & Cable Co.*

... FOR MORE DETAILS, CIRCLE NO. 304

## NEW ABRASIVE

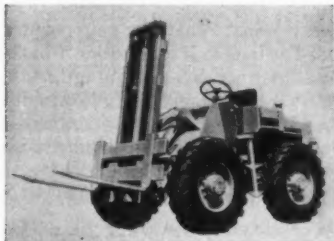
... for precision grinding

A new abrasive for precision grinding, 23 Alundum abrasive grain has been especially developed for such precision grinding operations as surfacing with abrasive segments. The new abrasive combines the friable, free cutting characteristics of 32 Alundum abrasive with the durability of 57 Alundum abrasive. This new grain is the result of a two-year research project undertaken to find ways of cutting costs in the segment grinding field. Field test reports have shown that segments made from the new abrasive grind more pieces per dressing with less tendency to burn and give longer life than previous segments used for the same operations. Investigations are now underway to determine other areas of application where 23 Alundum abrasive can reduce grinding costs. *Norton Co.*

... FOR MORE DETAILS, CIRCLE NO. 305

## FORK-LIFT TRACTOR

... has four wheel drive



A new, heavy-duty, four-wheel-drive fork-lift tractor with 6,000-lbs. capacity at 24" load center and 14-ft. maximum stacking height has been developed. This tractor, Model H-30, is also available with a 21-ft. lift mast at reduced capacity. Standard forks are 48" long and adjustable to 48" width. Designed especially for rugged outdoor applications, the unit offers many features not found in utility-type fork-lift tractors. The four-wheel-drive design gives both long wheelbase and wide tread with 12:00 x 24" tires. The rear (steering) axle mounting permits full axle oscillation of

18 degrees enabling the machine to operate over uneven surfaces. Torque-proportioning differentials and planetary axles provide the best possible traction. The all-welded mast is of 1/2" high-carbon steel channels with bronze wearing-pads between channels. All lift and tilt actions are hydraulically controlled with a 3-spool valve in a closed, pressure-controlled system. *Frank G. Hough Co.*

... FOR MORE DETAILS, CIRCLE NO. 306

## SCREWDRIVER FEEDER

... provides instant pickup of screws



An aid to screw-driving production and assembly is provided by a new instant pick-up screw feeder. This unit has a vibrating positioning bowl feeder with funnel feed-up for keeping a constant flow of screws in proper position for

contact. It gives instant pick-up by hand or power screwdriver whether equipped with vacuum, magnetic or spring-clip pick-up holder, and is especially applicable for small to miniature size screws. The feed-up funnel is oriented and machined to the specific screw and screwdriver holder being used. Because it automatically feeds screws, the feeder eliminates costly time wasted in fumbling for screws, finger positioning and finger holding, while aligning the screwdriver and completing driving of screws. It also cuts operator fatigue. *Burklyn Co.*

... FOR MORE DETAILS, CIRCLE NO. 307

## INDUSTRIAL LAMPS

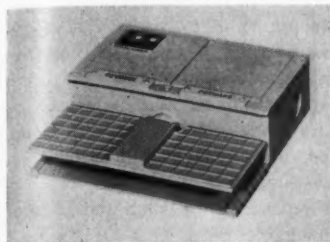
... of 1500-watts on 240-volt power

A new 1500-watt Quartzline incandescent lamp designed to operate on 240-volt power supplies is now available. Previous Quartzline lamps were 500-watts, operating on 120-volts, and 1500-watts, for 277-volt operation. Lamps in the third voltage multiply the commercial and industrial applications to which Quartzline lamps may be put. It is pointed out that in many areas where the lamps can be used effectively, only 240-volt power is available. These lamps differ physically from other incandescent types in that they come in quartz tubes, less than half an inch in diameter, rather than in glass bulbs. They offer the advantages of double the operating life of conventional bulbs, and of maintaining their original light output throughout life. The benefits are the result of a revolutionary iodine cycle, in which evaporating tungsten particles, which otherwise would darken the inside wall of the tube, are continuously redeposited on the filament. Quartzline lamps are used to floodlight industrial commercial and institutional buildings, inside and outside, and such areas as football fields, race tracks, golf courses, and others. Because they are linear, the light they produce can be controlled with great accuracy when lamps are housed in properly designed fixtures. *General Electric*

... FOR MORE DETAILS, CIRCLE NO. 308

## FOOT SWITCHES

... treadle operated for versatile control



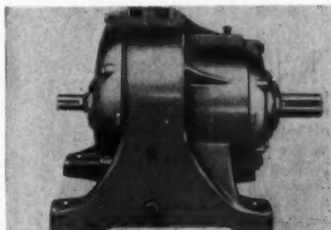
Two new treadle-operated foot switches are available in compact designer-styled enclosures. Both the Type A Standard Duty and Type C Heavy Duty C-H foot switches are de-

signed for A-c and D-c pilot circuit control. The contact mechanism used in the devices is precision unit switch which has single pole, double throw, twin break, silver contacts and is completely enclosed in a moulded phenolic block. The Standard Duty switch is 2-position, spring return and front treadle operated. Pressure on the treadle closes the N.O. contacts and release of the pressure returns the switch to the N.C. contacts. The device's single contact block is securely mounted in a NEMA 1 enclosure consisting of die cast case and a formed sheet metal cover and treadle. Forming on the treadle gives it rigidity and minimizes slippage of the operator's foot. The heavy duty foot switch contains two contact blocks and is side treadle operated. Designed for versatility, the treadle operation on this device can be readily adjusted in the field from 3-position spring return to 2 or 3-position maintained contacts. The switch comes in a NEMA 4 watertight enclosure with a die cast aluminum case, cover and treadle. A neoprene gasket between case and cover and a friction type seal on the treadle shaft assure watertight and oiltight performance. *Cutler-Hammer*

... FOR MORE DETAILS, CIRCLE NO. 309

## SPEED REDUCER

... has improved gear arrangement



A double reduction type speed reducer has been developed that incorporates an improved gear arrangement for low speed, high torque, extra capacity working performance. The re-

ducers are provided in two types of gear train construction, depending on the rating of the unit: Type GDO with normal double reduction gear train and type GLO, also double reduction, but with a duplex gear arrangement. Well suited for applications with space limitations, type GLO uses two primary gears and two final pinions to share the load from high speed pinion to slow speed output gear. Fully hardened, helical gears give maximum speed reduction and eliminate gear breakage caused from heavy duty loads. Use of a minimum number of parts in U.S. speed reducers minimizes excess wear and maintenance problems. Speed reducers come in a broad range of capacities—1/3 to 75 HP with ratios from 5.00 to 47.4. *U.S. Electrical Motors Inc.*

... FOR MORE DETAILS, CIRCLE NO. 310

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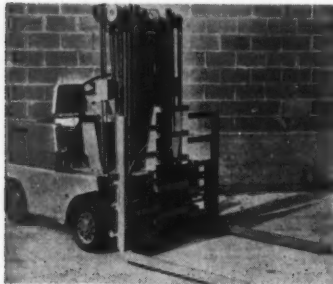
**Universal  
METAL HOSE CO.**

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## FORK TRUCK ATTACHMENT

... for palletless handling of cartoned goods



A new fork truck attachment for a palletless method of handling unit loads of cartons has been announced. The new attachment handles loads supported by a corrugated sheet which is scored to fit around the bottom of the load and

overhang on two special forks. The method reduces shipping costs by eliminating pallets and by permitting loading of highway trailers and boxcars with modular unit loads which prevent wasted space. The technique is particularly suited for handling bulky but relatively light loads shipped in cartons, such as empty glass containers and cans, packaged foods, bakery goods, drugs, dry goods and similar items. The attachment consists of a side shifting clamp, load back rest, a pair of special load carrying forks, 2 in. thick by 46 in. long, a double auxiliary valve and a hose line adaptation kit. *Clark Equipment Co., Industrial Truck Div.*

... FOR MORE DETAILS, CIRCLE NO. 311

## WEATHER-PROOFING ROOFS

... product can be specified for any type of climate

A new fluid-applied roofing material which simplifies the process of weatherproofing roofs of unusual design has been introduced. The specific need for a product of this nature has been prompted in recent years by the increased use of thin-shell concrete and plywood roofs of

curved, angular, or undulating slope. Designed for curvilinear roof decks with slopes of 2 in. in 12 in. or greater, the roofing is also recommended for canopies and similar building projections. Because of its extreme light weight, it provides reduced structural dead loads. The protective membrane covering a surface will in most cases weigh less than 20 lbs. per 100 sq. ft. Application may be accomplished through any of three methods. These include application by air-operated, pressure-fed rollers, by hand rollers, and by conventional spraying equipment. The particular method used will depend on the pitch and form of the roof. *Armstrong Cork Co.*

... FOR MORE DETAILS, CIRCLE NO. 312

## COMPACT PNEUMATIC PRODUCTS

... for high performance use where standard equipment doesn't fit

A complete new line of compact pneumatic products consists of small, high-performance manual and automatic-diaphragm, compressed air filters; pressure regulators; diaphragm-type relief valves, and compact lubricators. Any combination of the units is available. The regulators and relief valves are used with air, water, oil and similar fluids. The units are made for 1/8 in. pipe size and 1/4 in. pipe size. A small, combined filter-regulator unit is a feature product of the new line. The filter removes foreign liquids and solids from the compressed air, while the pressure regulator section controls the line pressure. Three compact units: filter, pressure regulator and micro-fog lubricator, make up a combination unit which automatically injects a continuous fog of extremely fine oil particles into the compressed-air line, providing lubrication for air-operated devices or for machine bearings. The entire unit is not much larger than a man's hand. *C. A. Norgren Co.*

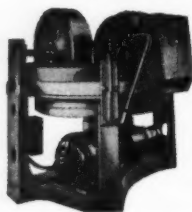
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# FERNHOLTZ HAS A COMPLETE LINE OF FOUNDRY MACHINERY

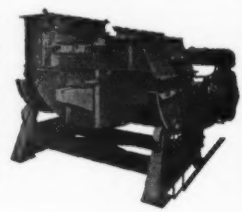
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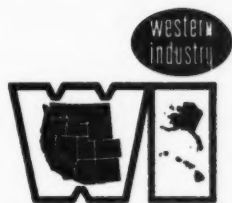
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WESTERN INDUSTRY / JANUARY 1961





# WESTERN INDUSTRY NEWS

THE INDUSTRIAL WEST . . . ON ITS WAY

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## Owens-Illinois Glass May Build at Tracy

TRACY, CALIF. — Owens-Illinois Glass Co. has contracted to purchase a 150-acre industrial site about four miles southwest of here for possible future use in building a glass container plant, the company announced recently.

"The Tracy site was selected because of our belief in the future growth of the San Joaquin Valley and the expanding demand for glass containers in the West," *Carl R. Megowan*, of Toledo, Ohio, president of Owens-Illinois, said in announcing the purchase.

The company's Pacific Coast Division, of which *H. S. Wade*, of San Francisco, Owens vice president, is general manager, also operates a closure and plastics plant at San Jose, a plastic bottle plant at Los Angeles, and sand plants at Corona, Ione, and Pacific Grove. An Owens subsidiary, National Container of California, has corrugated shipping box plants at Los Angeles and Oakland.

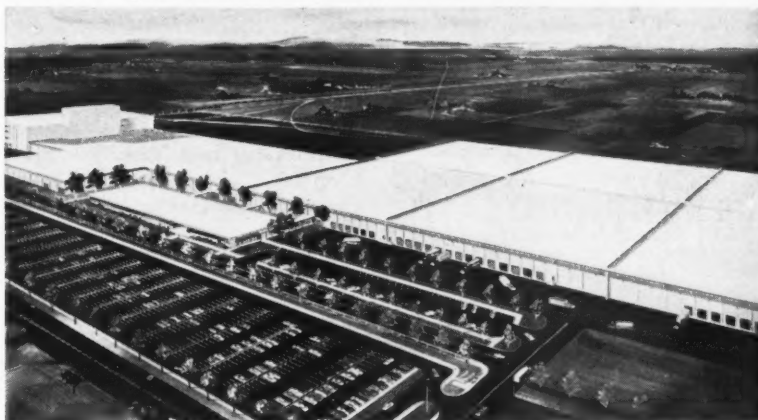
## Adhesive Company Buys Portland Plant Site

PORTLAND — The Oregon Department of Planning and Development has announced the purchase of a plant site here by Arabol, a New York-based adhesive manufacturing company.

Arabol has purchased a 12,000 sq. ft. building on N. Burgard St. and plans to put in some stainless steel equipment, the most modern type there is for the manufacture of adhesives, according to *Spencer Tilden*, vice president of the firm's Pacific Division.

The company makes about 400 adhesive products. Arabol customers in the Northwest include Bemis Bag, Crown Zellerbach, Chase Bag and Weyerhaeuser.

## Armstrong Rubber to Build \$25,000,000 Plant



HANFORD, CALIF. in the San Joaquin Valley has been selected as the site for Armstrong Rubber Co.'s new \$25,000,000 factory. The one-million square foot plant is designed to have an initial daily capacity, operating three shifts, of 10,000 tires.

SAN FRANCISCO — The Armstrong Rubber Co. has announced plans for a factory, warehouse and administration building near Hanford, Calif. with construction expected to begin in late January, according to *Frederick Machlin*, president.

*James J. Walsh, Jr.*, member of the board of directors, will be in charge of the new facilities. The plant covers

80 acres of the 320-acre site purchased by Armstrong; will initially employ 500 to 600 persons.

*R. J. Simpson*, divisional sales manager, Pacific Coast, announced simultaneously that the West Coast sales offices would be located in the new administration building in Hanford. Present offices are located at 601 Second St., San Francisco.

## Roberts Electronics To Build New Plant

LOS ANGELES — Roberts Electronics, Inc., 829 N. Highland Ave., is building a new \$1,000,000 plant at 5918 Bowcraft Ave., also in Los Angeles. Building will be completed around March 1st, according to *Eugene John Freeman*, vice president and general manager.

The tremendous backlog of orders for the company's tape recorders, the largest in the company's history, has necessitated an expansion of facilities.

## Container Manufacturer Opens Denver Division

DENVER — Fleming & Sons of Dallas, Tex., container manufacturer, will take a 10-year lease on a production facility now under construction at 1100 W. 45th Ave. by Leon and Silas Kobey, it was reported recently.

*Hardy Sanders*, general manager of the Dallas plant, will be general manager of the Denver facility which will be a corrugated carton manufacturing operation under Fleming & Sons container division.



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## New So. California Quarters for Carborundum



The Carborundum Co.'s 72,000 sq. ft. headquarters to be constructed in the City of Industry, Los Angeles, at a cost in excess of \$1,000,000 will be a distribution center for the company's abrasives and metal cutting tools. It will also house Pacific Abrasive Supply Co., a Carborundum subsidiary. Completion is scheduled early in 1961.

LOS ANGELES—The Carborundum Co. has concluded a 20-year lease for a 4½-acre site in the City of Commerce, on Yates Ave. near Washington Blvd., according to an announcement by the Gateway Co., realty development firm.

Harry Bayley, vice president of Pacific Abrasive, a Carborundum subsidiary, said the new building will service consumers, distributors, and jobbers throughout Southern California. Demonstration clinics at the building will exhibit machinery in actual use to help customers define methods and

costs of various abrasive tumbling or finishing equipment.

The facility will include 10,000 sq. ft. of humidified storage area for coated abrasives. Also included will be 10,000 sq. ft. of air-conditioned office area for administration, conference and sales use. UNIVAC equipment will have direct communication with Carborundum national headquarters at Niagara Falls, Bayley said.

Construction will be of reinforced concrete and steel roof girders.

## Helium Extraction Plant For Arizona

PHOENIX—Governor Paul Fannin has announced that Kerr-McGee Oil Industries, of Oklahoma City, will build a helium extraction plant in the Pinta Dome field in Apache County. The plant will go up near Navajo at a cost of some \$3,000,000, all private capital.

D. A. McGee, president, said his company had abandoned a plan to build a pipe line from the Pinta Dome area to the U. S. Bureau of Mines' helium plant at Shiprock, N. M. The helium produced at Pinta Dome will be sold to commercial users only.

The extraction plant, to employ about 10—principally specialized personnel, will process approximately 2.5 million cu. ft. of gas per day, with an anticipated yield of about 8% helium, McGee said. The helium will be shipped both by truck-trailer and by rail.

Recent federal legislation has opened the way for the first time to private processing and marketing of helium which heretofore has been a federal government monopoly.

## Oregon Research Men Develop Portable X-ray

MCMINNVILLE, ORE.—A revolutionary new suitcase-sized portable X-ray unit weighing only 85 pounds has been developed by Linfield Research Institute, here, according to an announcement by the Army Medical Service at the Pentagon, Washington, D. C.

The new self-powered clinical X-ray unit was developed by LRI to replace the 1,000-pound units which have been used at Army field hospitals, evacuation hospitals and mobile surgical hospitals. Another advantage of the new unit is that it operates at high speed.

Commercial production of the new machine for the non-military market is expected to be under way at Field Emission Corp., here, during 1961. A production prototype is under development and it may weigh considerably less than the 85-pound experimental model.

Initial concept and design were developed by Dr. Walter P. Dyke, director of LRI, and Frank J. Grundhauser with others making significant contributions to the project.

## New GM Assembly Plant Announced For Bay Area

SAN FRANCISCO—Plans to build a new automobile and truck assembly plant in the San Francisco Bay Area were announced last month by the Chevrolet Motor Div.

Edward N. Cole, vice president of General Motors and general manager of the Chevrolet Div., Detroit, said it is planned to start construction during 1961 with completion scheduled by the fall of 1962.

The new plant will be located on a 400-acre site at Fremont in Alameda County, on the east side of San Francisco Bay, approximately 24 miles southeast of Oakland and 17 miles north of San Jose.

"It is within easy driving range of the present Oakland passenger car plant," Cole said, "and thus it is convenient for the experienced workers at the Oakland plant who will be employed at the new location."

"With the new facility and continuation of operation of the present facilities, total employment in the Bay area will be increased," Cole said.

The Fisher Body Div. of General Motors also will build a plant on the same site to provide bodies for the Chevrolet passenger car assembly.

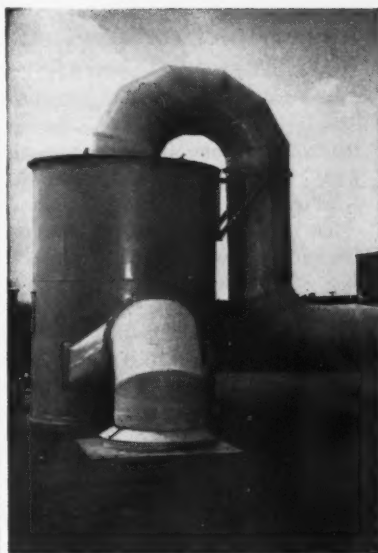
## B. F. Goodrich In New Salt Lake Building

SALT LAKE CITY—The B. F. Goodrich Co. has completed its move to a new building here at 450 West 17th South which provides adequate facilities for the company's Salt Lake zone sales offices and warehouse. The firm outgrew the building it formerly occupied at 651 W. 6th South.

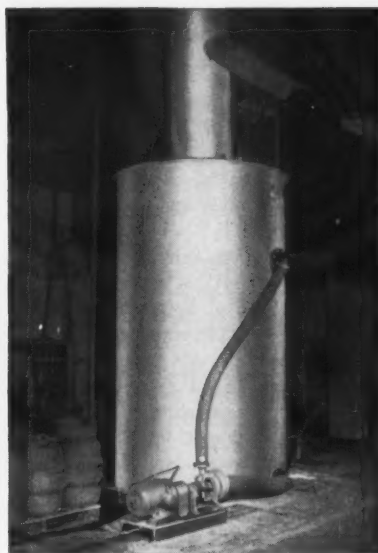
Two other company divisions with sales offices at the new location are B. F. Goodrich Industrial Products Co., and B. F. Goodrich Aviation Products.

J. W. Martin, Salt Lake zone manager for B. F. Goodrich Tire Co., a division of B. F. Goodrich Co., said the expansion provides space for doubling the company's tire inventory.

Modern offices and warehouse occupy the new building's 27,149 sq. ft. which are located on a two-acre tract allowing for expansion when needed. The Salt Lake zone covers Utah, and parts of Montana, Idaho, Wyoming, and Nevada.



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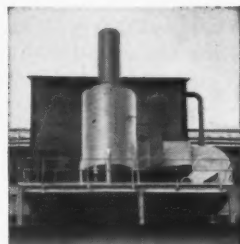
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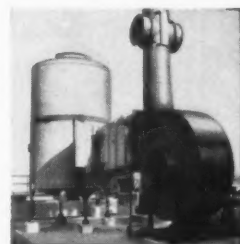
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## Break Ground for Salt Water Conversion Plant

SAN DIEGO—A ground-breaking ceremony for the \$1,608,000 sea water conversion plant to be built by the State and Federal governments on a 30-acre site on Point Loma, was held last month.

San Diego was one of five cities selected by the U. S. Interior Department's Office of Saline Water to be sites for five different types of experimental sea water conversion plants.

The San Diego plant will use a multi-stage evaporation process developed by the Fluor Corp., Los Angeles. The method is an advanced version of distillation. Heat will be used to create steam and the fresh water will be obtained from the steam.

Completion of the plant is scheduled for the early part of 1962. Dr. Arthur L. Miller, director of the Office of Saline Water, believes that experimental plants such as the one to be built here can convert sea water for as little as \$1.00 per thousand gallons.

San Diego will build a 3½-mile pipeline from the plant to the City's Point Loma Water Reservoir to carry the water.

## McKesson & Robbins Buys Western Chemical

PHOENIX—Western Chemical Co., operating in Phoenix and Tucson, and the Western Chlorine Co. in Tolleson have been purchased by McKesson & Robbins, Inc., of New York.

The acquisition includes Western Chemical's distribution facilities at 675 S. First Street, Phoenix, and in Tucson, and its Western Chlorine re-packing plant at Tolleson.

The new facilities will be operated as branches of the drug concern's chemical department.

## Metal Controls Laboratories Acquired by Magnaflux Corp.

LOS ANGELES—The Magnaflux Corp., Chicago, a wholly owned subsidiary of General Mills, has acquired Metal Control Laboratories, here. According to the announcement, the Magnaflux acquisition is aimed at effecting a complete complement of integrated nondestructive, metallurgical, and physical testing facilities and skills.

Jonmore Dickason, vice president of MCL, will continue in the management of the firm's activities.

## Boise Cascade Container Opens Denver Area Plant

GOLDEN, COLO.—Production capacity for making corrugated shipping containers in the Denver area has been more than doubled with the opening of a new plant near here by Boise Cascade Container Corp., a wholly-owned subsidiary of Boise Cascade Corp.

The new plant, which covers 90,000 sq. ft., has the initial capacity to make 30,000,000 sq. ft. of corrugated board per month and convert it into boxes which are extensively used for shipping beverages, canned goods, produce, hardware, meats and hundreds of additional items.

The Golden plant is the third of its kind in Boise Cascade Container Corporation's chain, plants previously having been put into operation at Wallula, Wash. and Burley, Ida. A fourth plant presently is being equipped at Sunnyvale, Calif.

The plant is under the direction of Gordon C. Randall, general manager of the Rocky Mountain Region, with John Stover as plant superintendent, and Bill Bridenbaugh as sales manager.



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**WESTERN INDUSTRY / JANUARY 1961**



## Protective Garb For Handling Toxic Fuels



A two-hour supply of liquid air makes it possible for this technician to work free from contaminated atmosphere which surrounds him. After the supply of liquid air is depleted, the life support system is refilled.

LOS ANGELES—A life support system enclosed in an air-conditioned suit that will protect its wearer against completely hostile environments, and with modification, the rigors of outer space, was announced recently by AiResearch Mfg. Div. of the Garrett Corp., here.

The system, designed to be used in conjunction with the handling of toxic missile fuels, may also be used in the chemical processing industry in areas of poisonous fumes; fire fighting and rescue; mining; nuclear plants; pre-flight ventilation of flying suits; or in any area where protection from surrounding atmosphere is needed, according to Garrett engineers. Various types of suits and communication techniques can be used with the life support system, depending on its application.

## Hamilton Electro Sales Appointed Motorola Rep

LOS ANGELES—Hamilton Electro Sales, 12308 Wilshire Blvd., here, has been appointed as an industrial distributor for semiconductor components by Motorola Semiconductor Products Inc., according to Don R. Smith, distributor sales manager. Hamilton will provide distributor services to the southern California area surrounding Los Angeles. Motorola manufactures complete lines of power, mesa, and milliwatt transistors, as well as some 2,000 types of silicon rectifiers and zener diodes.

## Form Hawaiian Firm To Handle Plastic Coating

HONOLULU—A new corporation, Sun-Stop of Hawaii, Inc., has been established to handle Islandwide distribution of Sun-Stop Glass Coating, a plastic product which controls fade, glare and heat.

Stanley Pantell, president of the new firm, is also vice president of Refrigeration Service and Supply of Hawaii. Gerald E. Pendrey is vice president and general manager of the new firm which has offices at 1325 Kamaile St., here.

## German Manufacturer Eyes The Dalles for Subsidiary

PORTLAND—The Mid-Columbia Development Corp., here, announced recent negotiations with a major German heavy manufacturing industry over the location of a subsidiary plant in The Dalles.

The Jucho Co. of Dortmund, Germany, a diversified heavy machinery maker, is contemplating putting in a manufacturing plant for Jucho Cranes. These would be similar to the Jucho Crane installed at The Dalles Dam and at Ice Harbor Dam.



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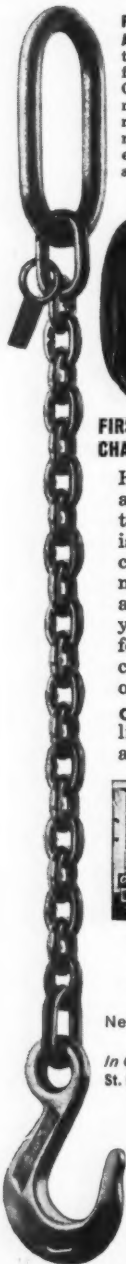
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## Coast Envelope Merges With Hammermill Paper

LOS ANGELES — Coast Envelope Co., here, and its subsidiary, Coast Book Cover, recently announced their merger with the Hammermill Paper Co., according to Alex Kensey, president of Coast Envelope.

Hammermill acquired Coast for 122,838 shares of Hammermill common stock, worth nearly \$3,500,000 on the New York exchange.

In making the announcement, Kensey said there will be no change in the Coast operation, however the merger will make available additional capital resources.

Hammermill recently acquired control and began expansion of a complete paper manufacturing facility in Hoquiam, Wash. Coast Envelope has manufacturing plants in Los Angeles and San Francisco and together with its subsidiary Coast Book Cover, with manufacturing facilities in Los Angeles and sales offices in San Francisco, San Diego, Portland, and Seattle, have annual sales of over \$6,000,000.

## SKF Industries Slates New Portland Warehouse

PORTLAND — With completion date scheduled for March 1, construction is underway on the 11th unit in Davis Industrial Park, here, of a new 10,000 sq. ft. warehouse and office leased to SKF Industries, Inc.

The building will be of tilt-up reinforced concrete construction with steel pipe columns and glue-lam beams. The warehouse for SKF, makers of ball and roller bearings, will supply the needs of Oregon, Washington, Idaho, Western Montana and Alaska. This is the fifth move for SKF since the company opened a warehouse here in 1926.

## Arizona Glazed Products Constructs New Building

TEMPE, ARIZ. — Work on a new \$30,000 building for Arizona Glazed Products Co. will be completed next month. The 5,000 sq. ft. structure is located in the Bell Buttes Industry addition, 630 W. 24th St.

The company puts a glazed ceramic surface on the face of pumas building blocks. Arizona Glazed Products is a subsidiary of Spectro Glaze, a Canadian company with headquarters in Edmonton.

## Aeronutronic Scientists To Make Lunar Capsule



Lunar capsule is put in cold trap by Physicist Robert B. Jones in "lunar night" test at Ford Motor Co.'s Aeronutronic Div., Newport Beach, Calif. Inside the cold trap the temperature will drop to minus 320 degrees F.

NEWPORT BEACH, CALIF. — The extreme cold of a lunar night is being simulated by scientists at Ford Motor Co.'s Aeronutronic Div., here, as part of a program to land a 300-lb. instrumented package on the moon within the next two years.

Information gained from the experiment will enable the scientists to construct a capsule that can withstand the rugged environment of the moon, where the temperature drops to minus 250 degrees F at night and warms to a plus 250 F during the day.

The capsule will be carried by the Ranger Spacecraft which Jet Propulsion Laboratory is developing. The spacecraft will be launched by an Atlas-Agena B and is the first in a series of National Aeronautics and Space Administration programs to study the lunar environment.

## Flying Tiger Line Buys New Airplanes

BURBANK, CALIF. — In a year-end statement, Robert W. Prescott, president of Flying Tiger Line announces the firm will put new Canadair CL-44 turbo prop-jet airfreighters into service in 1961, a plane that will hopefully boost capability of low-cost, high volume movement of freight.

Coupled with introduction of the new plane, the firm will push its new program that proposes extensive changes in existing tariff structures of airfreight, a program that the firm feels will open air traffic to items now restricted to surface movement.

## Construction Starts on Beckman Division Plant

FULLERTON, CALIF.—Beckman Instruments, Inc., has begun construction of a new \$1,250,000 building to house its Systems Div. at the company's headquarters plant here.

Robert Erickson, executive vice president, said occupancy of the 100,000-sq. ft. building is scheduled for May.

The construction project is the third undertaken by the instrument firm in recent months. A 28,000-sq.-ft. addition to the headquarters plant was completed Nov. 15, and a 43,000-sq.-ft. addition to the company's Spenco Div. plant, Palo Alto, Calif., is scheduled for occupancy this month.

Erickson said the Systems building project was dictated by steadily increasing business for the division, which specializes in the development and manufacture of high-speed electronic data processing systems for industry, defense and space age projects. He said present Systems volume is nearly double that of a year ago.

## GE Computer Dept. to Build Lab at Sunnyvale

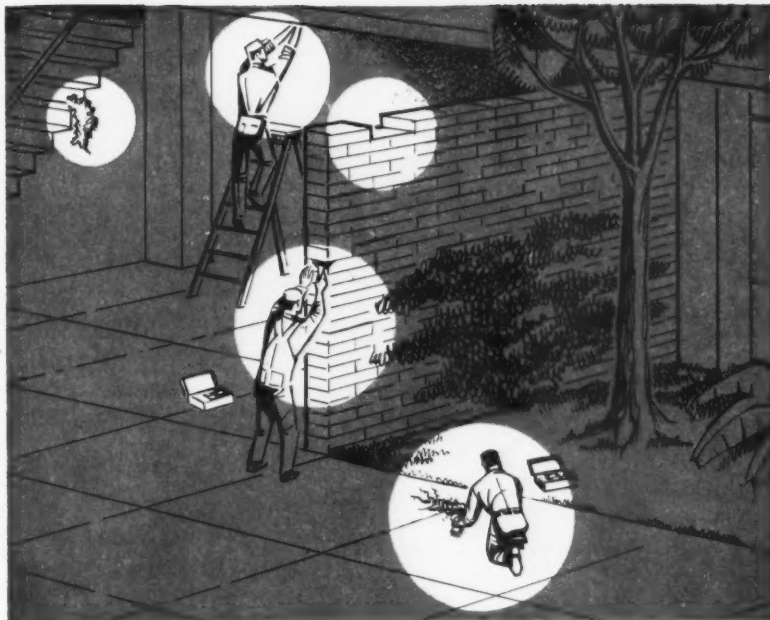
SUNNYVALE, CALIF.—Plans for establishment of a new Advanced Computer Development and Research Laboratory here, were announced recently by Clair C. Lasher, general manager of General Electric's Computer Dept. at Phoenix.

Construction of the new 49,000 sq. ft. lab is expected to start in the spring with occupancy by GE lab personnel scheduled for December, 1961. Lasher said the lab will be located at the International Science Foundation in Sunnyvale.

According to Lasher, the new lab building will be expandable to 76,000 sq. ft. if required. Estimated cost of the new building is "approximately \$1,500,000."

## A.B.C. Pattern Works Moves To Larger Plant

SAN LEANDRO, CALIF.—A.B.C. Pattern Works, formerly located at 516 23rd Ave., Oakland, Calif., has moved into new and larger headquarters at 456 Hester St., here, tripling the firm's floor space. A.B.C., which serves foundries and manufacturers of Northern California, also announced the addition of a true trace duplicating machine to its equipment.



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## Bullen Concrete Buys

### American Marietta Plant

PUEBLO, COLO.—Bullen Concrete Products Co. here has purchased the Pueblo plant of the American Marietta Co., 200 E. 26th, according to Fredrick H. Bullen, president.

The plant, which will increase diversification of Bullen's pre-stressed concrete operations, will be moved to Bullen's yard to be remodeled. It should be in operation shortly after Jan. 1, he said.

Eventually the plant should add employment for 15 to 20 men. It also will complement production at the Pueblo plant of Colorado Fuel & Iron Corp., which manufactures pre-stressed cable used in the concrete.

Equipment at the yard includes a batch plant, forms and cables.

## Linney Co. Named Rep For Cherry Rivets

OAKLAND, CALIF.—The H. E. Linney Co., here, has been appointed exclusive Northern California distributors of Cherry commercial blind rivets. Cherry Rivet is a division of the Townsend Co.

## Green-Penny Building New Oakland Facility



Shovel in hand, Tom Penny, president, Green-Penny Co. breaks ground for the firm's new sales and warehouse center. The group includes Oakland Chamber of Commerce members, Standard Pressed Steel personnel, and Green-Penny Sales Manager Edward Ferguson and Office Manager Norman Winkler.

OAKLAND, CALIF.—Scheduled for occupancy February 1, a new 18,000 sq. ft. facility is now under construction at 200 Hesenberger Rd. for the Green-Penny Co. The new facility will include 15,000 sq. ft. of warehouse space, 3,000 sq. ft. of office space, and 2,000 sq. ft. of yard area.

Presently located at 2211 San Pablo Ave., Oakland, Green-Penny offers full lines of steel shelving, storage

racks, shop and material handling equipment. The company's main offices are at 4180 E. Noakes St., Los Angeles.

## Georgia-Pacific Selects Olympia for Plant Site

OLYMPIA, WASH.—The Georgia-Pacific Corp. has selected a site here for the firm's \$1,500,000 corrugated box plant. The company had earlier announced it was looking for a suitable site for the plant in the Northwest.

Robert E. Flowerree Jr., president of Georgia-Pacific Paper Co., a subsidiary of Georgia-Pacific, said that construction of the 120,000 sq. ft. converting facility has been started in the Lacey area near here.

Scheduled for completion in March, the plant will have a capacity of 25,000,000 sq. ft. of finished corrugated a month and will provide the area with a payroll of about 125 persons. The plant will make a complete line of corrugated boxes and special containers, including industrial packers.

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Colorado, SUNset 9-3137

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## Simonds Abrasive Opens New Los Angeles Branch

LOS ANGELES—Simonds Abrasive Co., with plants in Philadelphia and El Monte, Calif., has announced the opening of a new Southern California branch warehouse, sales office and service shop at 1950 East 20th St., here. The branch will also serve Arizona and a portion of Nevada.

The new facility, which incorporates the latest ideas in single level design and construction, air conditioning, lighting and equipment, provides ample warehousing space for the firm's line of grinding wheels, and abrasive grain for polishing, deburring and precision finishing.

Heller Tool Co. and Simonds Saw and Steel Co., divisions of the Simonds Co., will also headquarter at the new facility.

## Zellerbach To Expand Ply Unit \$2,500,000

PORTLAND—The Crown Zellerbach Co. has announced that engineering work has begun on a \$2,500,000 plywood plant at the company's St. Helens operations.

John Fulton, general manager of Crown's Northwest Lumber and Plywood Div., said that the new installation when completed next fall will mean jobs for another 160 men and the production of 10,000,000 ft. of sanded plywood a month.

He said the new operation will work from veneer produced by the Crown veneer plant already in operation at St. Helens. The plywood operation will be added to Crown's highly automated sawmill which opened in St. Helens last month, and will give the company a sawmill, veneer and plywood integration.

## Gamear Corp. Plans New Prescott Plant

PRESCOTT, ARIZ.—Construction will begin this spring on a new plant for the Gamear Corp., manufacturers of photo equipment. Charles C. Melton, president of Gamear, said some 50 persons will be employed at the new factory to be located adjacent to the municipal airport.

The new building, to cost about \$40,000 and occupy 4.6 acres, will provide for expanded research and development of new equipment, Melton said.

# New all-wrench tool set cuts maintenance time

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## Ray Products Expands Production Facilities

ALHAMBRA, CALIF.—The acquisition of additional production and manufacturing space totaling 7,500 sq. ft. has been announced by *Allen Ray*, president of Ray Products Inc., here. The new building, adjacent to the firm's present plant, will house a new four ram, air operated forming press and a forming oven.

According to Ray, the new press will be used for forming large parts with fairly huge production runs. The new press permits a production capability improvement of 35 per cent. The oven can handle sheets to 10 ft. by 12 ft. for forming. The firm fabricates, vacuum forms, and machines plastic products for industry.

## Porcelain Company to Build Plant at Tracy

TRACY, CALIF.—The Challenge Stamping & Porcelain Co. of Grand Haven, Mich., recently announced plans for construction of a new facility here. The plant will be engaged in the coating of steel bath tubs, sinks, lavatories and similar items with porcelain.

## Bethlehem Shipbuilding Continues at Even Pace

SAN FRANCISCO—Reviewing shipbuilding activities at the San Francisco yard during 1960, *T. C. Ingersoll*, general manager of Bethlehem's Shipbuilding Div., Pacific Coast District, said that the company has been able to maintain an average employment of 2,500 for the past two years.

Ingersoll said new construction work has been a major factor in keeping this employment at a high level and that special product work along non-marine lines, as well as ship repairs, have been factors in stabilizing the work force.

## Ringsby Acquires Coast Bulk Liquid Carrier

DENVER—*Gail H. Crawford*, executive manager of Ringsby Truck Lines, here, has announced the purchase of Arizona Pacific Tank Lines, a Western bulk liquid hauling operation. Purchase price of the Compton, Calif., based firm was in excess of \$350,000, Crawford said. Arizona Pacific operates terminals in Phoenix, Richmond, and Compton, Calif.

## Hexcel Names New Reps For Polyurethane Foams

EL SEGUNDO, CALIF.—Applied Plastics Div. of Hexcel Products Inc. has appointed several new sales representatives and distributors to market its products. The division, headquartered here, produces polyurethane rigid foams, epoxy hardeners, coatings, adhesives and related products.

Representing Hexcel's new division in Hawaii is the Refrigeration Service and Supply Co., Honolulu. Serving as a distributor in the Northwest will be Western Fibrous Glass Products Co., with offices in Seattle and Portland.

Royell, Inc. with technical sales offices in Palo Alto, Calif., will cover Northern California; Thalco, Inc., Los Angeles, the Southern California area and W. E. Brentner Co., San Diego.

## GE to Close Oakland Lamp Plant Feb. 10

OAKLAND—The closing of the General Electric lamp plant, located at 1614 Campbell St., on February 10, 1961, was announced last month by *Rees D. Paine*, manager of the plant. The Company is consolidating production into more efficient and economical units to combat rising costs.

According to Paine, efforts to place the 173 employees in other GE operations in the area are already underway preceding a major placement effort among other Bay Area industry.

*Donald D. Scarff*, general manager of GE's Large Lamp Dept. in Cleveland, Ohio, said that the move was necessary to help combat rising costs. "Consolidation of our productive facilities into more efficient, more economical units is vitally necessary to combat inflationary costs in order to maintain our competitive position. Three shift operations in other plants, improved methods, and advanced technology help make this possible."

Scarff emphasized that the move in no way detracts from GE's expansion activities in the West. "In our lamp business alone," he noted, "our Western facilities, particularly in customer service operations and warehouses, have nearly doubled in the past five years. In this same period the Company has established two of its newest and greatest growth potential businesses in the West; computers in Phoenix, Ariz., and atomic products in San Jose, Calif."



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## Adams Rite Mfg. Adds New Plant Facilities

GLENDALE, CALIF.—The Architectural Hardware Div. of the Adams Rite Mfg. Co., here, has announced completion of its move into a new building adjoining its present plant location.

The new building, especially designed to mechanize the operations of the division, increases production capacity 30 per cent and has freed the original plant facilities for the use of the Aircraft and Industrial Div.

Arthur R. Adams, president, said the firm will continue to diversify its operations, both in products and markets. The company now manufactures locks, latches and accessory hardware, and mechanical controls for aircraft, electronics and general industrial applications.

## Wilshire Installs Automatic Electronic Gasoline Blender

LOS ANGELES—The world's first automatic electronic gasoline blender has been placed on stream at the Wilshire Oil Co. of California refinery in Santa Fe Springs, according to a recent announcement by Mark E. Houser, vice president of manufacturing. This occasion climaxed more than 13 months of extensive engineering and planning by the oil company.

The advantages of an electronic system are greater formulation accuracy and ability to use longer signal transmission lines from the control console valves of the actual blending equipment.

The blend operator sets the blend formulation from push buttons at the console. The blend will proceed automatically until the desired quantity of blended gasoline is delivered at which time the electronic blender will shut off all valves and stop all pumps.

## John Hassall Adds Two Western Representatives

LOS ANGELES — Les Sachs Associates, here, has been named sales representative for John Hassall, Inc., Westbury, Long Island manufacturer of fasteners and hold headed specialties. Blake Smith, former Hassall representative, has joined the Sachs firm which will cover California, Arizona and Nevada.

Western Empire, Inc., of Englewood, Colo., was named sales representative for Colorado, New Mexico, Utah and Wyoming.

## D'Velco Mfg. Co. In New Facilities

PHOENIX—D'Velco Mfg. Co. of Arizona, sub-contractor for aircraft and guided missile parts, has occupied its new plant at 401 So. 36th St., moving from quarters at 4605 E. Sherman.

The 40,000 sq. ft. plant cost more than \$150,000 to build and is architecturally attractive as a "garden type" factory. General offices are located in one corner and the remainder of the structure is laid out for precision small machine work.

## Power Brake Equipment Completes New Addition

PORTLAND—The Power Brake Equipment Co., here, has completed construction of a new building at 1700 S. E. 11th Ave., opposite its present site.

The move will double the firm's manufacturing parts and storage space according to Norman C. Williams, president. He said the new construction, remodeling of the present plant and other phases of the expansion will cost in excess of \$200,000.

# The ZIEGLER idea of STEEL SERVICE

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## New Manufacturing Firm Incorporating In Idaho

NAMPA, IDA.—The Chamber of Commerce announced last month that a commercial refrigeration manufacturing firm, to incorporate in Idaho under the name of Cold Cache Mfg. Co., Inc., will open a factory here.

The firm will take over the plant occupied until recently by the Leiber Industries, said *Bob Sarles*, Chamber manager. *Morris Smith*, company executive vice president, said a lease-purchase agreement for the factory property has been completed.

Between 30 and 50 men will be employed at start of operations, expected in January. Eventually plans call for employment of 100 workers.

## Pineapple Firms Need New, Better Machinery

HONOLULU—Hawaii's pineapple industry needs "more new and imaginative machines and processes" in order to reduce costs of production and remain competitive, *L. V. Hass*, vice-president of Libby, McNeill and Libby, told a recent meeting here of the American Society of Agricultural Engineers.

Hass said that although the pineapple industry is now highly mechanized, he urged the following innovations: A conveyor belt line replacing trucks in delivering pineapple from Wahiawa plantations to Honolulu canneries, a fully automated harvesting machine, a fool-proof planting machine, and new methods to reduce handwork in the canneries.

## Potash Mine and Processing Complex Underway in Utah

MOAB, UTAH—The Texas Gulf Sulphur Co. has announced construction is underway on the nation's largest potash mine and processing complex at Cane Creek, near here.

*Claude O. Stephens*, president, said between 250 and 300 persons would be employed at the million-dollar complex. They will mine potash beds 2,700 feet below the Dead Horse mesa area on the Grand-San Juan County lines.

Texas Gulf will be producing commercial potash by 1962, he said. The plant was designed to produce "well over one million tons of muriate of potash annually," he added.

## Air Reduction Moves To New Portland Quarters



Air Reduction Pacific Co.'s new Portland headquarters will serve the Portland trading area which includes in addition to the State of Oregon, southwestern Washington and Idaho.

PORTLAND—The Air Reduction Co. has moved its offices, warehouse and service facilities to new, larger and modernized quarters at 1325 N. W. Kearney St., here, according to *Stan-ton Richardson*, manager.

At this new location Air Reduction will carry a complete stock of gas welding and cutting apparatus and supplies, electric arcwelding machines, electrodes, "Aircomatic" and "Heli-

weld" inert gas arc welding equipment and filler metal as well as oxygen, acetylene, nitrogen, argon, helium and hydrogen. There are facilities for display and demonstration of these products and also a factory supervised apparatus repair department.

Gas manufacturing plants are operated by Airco at 2949 N. W. Front Ave. and 4959 N. W. Front Ave., Portland.

## Industry Sees New Gas Absorption Cooler

LOS ANGELES—A new gas absorption cooler, termed "a major breakthrough" in gas air conditioning and cooling for commercial and industrial applications, went on display at Statham Instruments Inc. In attendance were representatives from Southern California and Southern Counties Gas Companies and members of the American Gas Assn.

*Louis D. Statham*, president of the manufacturing firm, says the device may offer operational savings from 35% to 50% higher than with conventional cooling units. He said the cooler is marked by lower maintenance costs and quiet operation.

## Eastman Pacific Installs Press For Hose Assemblies

SAN MARINO, CALIF.—Eastman Pacific Co., here, a pioneer West Coast supplier of hydraulic hose and fittings, has installed a new 100 ton press for the manufacture of super high pressure hose assemblies.

Designed by Eastman, the new press permits the installation of couplings on four and six spiral wire hose.

## New Macomber Plant to Be Operated by Kaiser

MONTEBELLO, CALIF. — Macomber Inc., a producer of open web steel floor and roof framing members, will open a new West Coast production plant according to *Robert Macomber*, president. Macomber stated that in co-operation with Kaiser Steel Corp., new production facilities will be located at Kaiser's fabricating plant here.

The new plant, to be operated by Kaiser, will produce Macomber All-span steel joists. Distribution and engineering will be done by Macomber. Necessary new equipment and production facilities will be installed with the beginning of production scheduled for spring 1961.

## Alta Engineering Named Hydro-Line Distributor

DENVER—Hydro-Line Mfg. Co., Rockford, Ill., has appointed Alta Engineering Co., here, to engineer, sell, and service all Hydro-Line fluid and air power products. Alta will represent Hydro-Line in Colorado, Wyoming, Utah, southern Idaho, and northern New Mexico. Sales offices are located in Denver and Salt Lake City.



## Apaches To Build Arizona Sawmill

WHITERIVER, ARIZ.—Plans to construct a \$1,750,000 sawmill near Whiteriver have been announced by the White Mountain Apache Tribal Council.

Lester Oliver, tribal chairman, said the sawmill will produce 29,000,000 board feet of lumber annually, create about 120 jobs and have an estimated annual payroll of \$560,000.

He said the tribe has enough timber to supply the mill indefinitely without touching reserves set aside for sale to outside companies. Cutting will be on a sustained-yield basis.

Oliver said the council approved an initial appropriation of \$150,000 to start the project. Construction is to begin in the near future.

## RCA Completes First Leg Of Microwave Network

SANTA BARBARA, CALIF. — Installation of microwave equipment for the first leg of Western Union's transcontinental microwave network has been completed by the Radio Corporation of America.

The 250-mile, multi-hop section, linking Santa Barbara and Sunnyvale, Calif., was activated on schedule, J. J. Graham, Division vice president and general manager, RCA Communications and Controls Div., disclosed recently.

Two parallel radio frequency circuits now are carrying message and video band information from the Santa Barbara area to the Sunnyvale area.

This initial section is part of the 3,700-mile Western Union microwave system which will provide split-second communications between major east, middle west and far western cities. Two hundred and twenty-six relay stations are scheduled for installation during 1961-62.

## Nu-Art Lighting Moves Into Larger Facilities

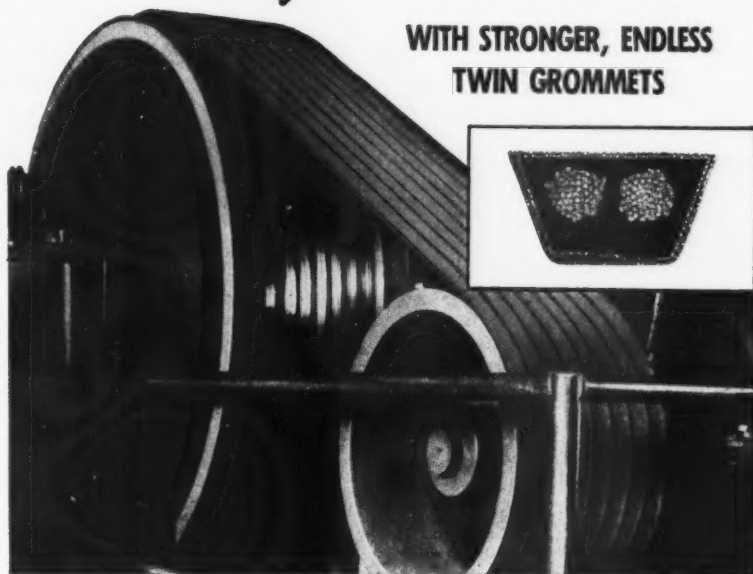
SALT LAKE CITY—Nu-Art Lighting & Mfg. Co. has moved into its new \$140,000 building at 2360 W. 21st South which provides twice as much space as at the old location, according to Herbert R. Schoepf, president.

The move permitted the firm to triple its capacity with modern, streamlined manufacturing production lines, he said.

# GOODALL

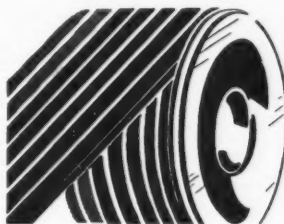
## "PowerKing" VEE-BELTS

WITH STRONGER, ENDLESS  
TWIN GROMMETS



Try "Power-King" Vee-Belts—and note the savings they give through increased load-pulling capacity and efficiency.

The larger, stronger, continuous twin grommets permit the use of greater horsepower on the drive. Stretching is reduced—tension sustained. Belts last 20% to 50% longer.



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## Temescal Metallurgical Moves, Adds Equipment

BERKELEY, CALIF.—As part of an expansion program, Temescal Metallurgical Corp. has moved its offices and plant from Richmond, Calif. to a new location at 2850 Seventh St. in Berkeley. Purpose of the move, said Temescal president *H. R. Smith Jr.*, is to provide room for both current and long range expansion plans.

Smith revealed that a new electron beam furnace is under construction and is expected to be in operation by mid-March. When completed it will stand approximately three stories high and will weigh in the neighborhood of 25 tons.

"The new furnace," Smith said, "will make possible production of refractory metals such as tungsten, zirconium, and titanium as well as cobalt and nickel alloys and specialty steels."

## Torrey Pines Site for Salk Research Center

SAN DIEGO—*Dr. Jonas R. Salk*, the developer of polio vaccine, announced that he expects construction of his research site on Torrey Pines Mesa here to get under way early this year.

Salk will be here this month to confer with city officials on the conditions of the land conveyance. The 27-acre site is a gift from San Diegans who voted approval of the research center last Spring.

The State gave Salk incorporation papers last month to set up the Institute of Biology at Torrey Pines. The Institute will be a non-profit organization.

"This is what we have been waiting for," Salk said. "We now have the legal organization to exist and can accept funds."

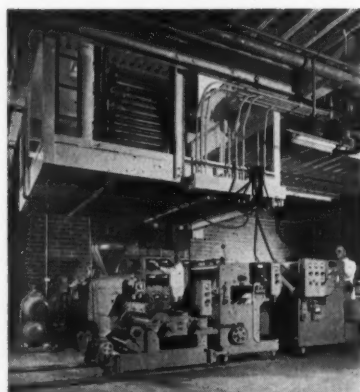
Salk said he will begin operations here with about 10 scientists, which will include several from Europe.

## White Motor Named Rep For Gray Marine Units

KETCHIKAN, ALASKA—White Diesel Engine division has been appointed distributor of Graymarine engines throughout the Pacific Northwest, it was announced recently by *Ralph Peters* of White Motor Co.

Outlets in Seattle, Portland and Astoria, Ore., as well as Ketchikan are affected.

## Dow Unveils Expanded Plastics Lab Facility



Typical of complex processing machinery found in the Dow Plastics Technical Service Laboratory, Torrance, Calif., is this unit used to cast polypropylene film. Clear and tough, the film has many packing applications.

TORRANCE, CALIF.—Dow Chemical Co. last month opened its expanded and improved Plastics Technical Service for an open house that featured production machinery and testing devices for polypropylene-based plastics used in molded, coated, film and foam applications.

The testing facility is the predecessor of a polypropylene plant that will be built by Dow in 1961 at its Torrance site. According to *L. E. Tallman*, plastics technical service manager for Dow in the West, the technical service unit is offering service to customers in a wide variety of plastics fields.

Polypropylene is relatively new in terms of commercial usefulness, Dow spokesmen pointed out, but is highly adaptable to injection molding of automotive and industrial parts, filaments for industrial fabrics, films for packaging, coating for wires, and stress crack resistant pipe.

According to Tallman, the substance has a number of property advantages, among them lowest density of all commercial plastics, excellent heat resistance and chemical resistance.

## Glenn Pacific Announces Change in Corporate Name

OAKLAND, CALIF.—Glenn Pacific Power Supply Corp., manufacturers of welding and industrial power supplies, located at 703 - 37th Ave., here, will henceforth be known as Glenn Pacific Corp. according to a recent announcement by *George G. Glenn*, president.

## Crane Division Acquires Line of Digital Devices

BURBANK, CALIF.—Hydro-Aire Co., part of the Crane Co.'s Systems and Controls Group, has acquired the product line in analog to digital conversion of the Jones and Wettlauffer Engineering Corp., Los Angeles.

A phototron, the basic transducer for converting shaft angle to digital measurement information, forms the core of the line. Hydro-Aire plans to build the device in its own Electronics division at 3000 Winona Ave., here, and market it through its national sales organization.

In addition to the phototron, associated power supplies and binary and digital counters will soon become available, Hydro-Aire reported.

## Zellerbach To Help Make Newsprint From Bagasse

SAN FRANCISCO—Crown Zellerbach Corp. and the Hawaiian sugar industry, acting through the Hawaiian Development Co., have announced a joint agreement with *Sahu Jain, Ltd.*, of Calcutta, India, to provide a technical assistance and patent rights for the production of newsprint from bagasse, the fibrous residue from cane sugar production.

The joint agreement with the Indian concern was concluded following eight years of intensive research by the two organizations on methods for making paper of commercial quality from sugar cane fiber. The research project involved both extensive pilot plant experimentation and successful commercial size test runs of bagasse newsprint in Crown Zellerbach's facilities in the Northwest.

## Grenco Named Western Rep for DriQuik Ovens

PORTLAND—Grenco, Inc., 2035 S. W. 58th Ave., here, has been appointed West Coast representative for DriQuik ceramic type electric infra-red ovens, according to *M. N. Kanouse*, president of Dry Clime Lamp Corp., Greensburg, Ind., manufacturer of DriQuik ovens.

Grenco, headed by *H. John Knapp*, also has facilities at 1556 West Ninth St., Long Beach, Calif., where a complete finishing line was recently installed to provide a complete testing service for manufacturers and for metal and wood finish suppliers.



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## Robbins Says Steel Firms Must Innovate, Sell Hard

LOS ANGELES — *Fred J. Robbins*, recently elected chief executive of Bliss & Laughlin and for many years head of local firm of Sierra Drawn Steel, believes the steel industry must sell and promote its product to offset new materials that are taking its place.

Speaking during a Los Angeles press conference Robbins said that steel is no longer the pace setter in American economy. The "built-in" market for steel has been supplanted by commonly known substances such as concrete, and plastics.

Steelmen are taking stock of the situation and are developing new steels that will offer cost cuts and weight savings, Robbins said. He gave new steel for the canning industry as an example. Super light tinplate will bring future savings up to 15% in cost to the canning field, he said.

Robbins added that a period of steel inventory accumulation is expected that may offset the low inventory cycles that began about late 1956. Higher productivity through automation will help the steel industry to bring products to market at more attractive prices, he concluded.

## Douglas Aircraft Sells Interest in DataGraphic

SANTA MONICA, CALIF. — Sale of the Douglas Aircraft Co.'s controlling interest in DataGraphic Systems, Inc., to General Aniline & Film Corp. was announced jointly by Douglas Aircraft and General Aniline. The amount involved in the purchase was not disclosed.

Douglas said it had made the divestment in order to direct its diversification efforts into fields more directly utilizing the company's skills and which promised more immediate returns.

Sale of its interest in DataGraphic came shortly after Douglas announced the organization of Astropower, Inc., a subsidiary formed to conduct research and development in advanced propulsion systems and power equipment.

DataGraphic, which was owned jointly by Douglas and General Aniline, began business on Jan. 1, 1959, developing and marketing machines, materials, techniques and systems in the field of microfilm miniturization and data handling.

## Expanded Facilities for L. C. Miller Co.



L. C. Miller Co.'s new plant facilities in Monterey Park, Calif., covers 14,300 sq. ft., an area which more than triples the firm's previous facilities.

MONTEREY PARK, CALIF.—L. C. Miller Co., specialists in metalworking activities such as ultrasonic and electric disintegration machining of space-age materials, and metal joining and fabrication by high frequency induction heating, has moved into new facilities.

The company has also added two new induction heaters and installed a new Cincinnati electric discharge machine that threads difficult-to-machine metals by electric disintegration. Miller also manufactures induction heating accessories.

## Industrial Downey Marks Incorporation Anniversary

DOWNEY, CALIF.—An incorporated industrial suburb of greater Los Angeles, Downey, Calif., celebrated its fourth year as an independent city with an exhibit honoring products of industrial firms located there.

After four years the city has accumulated an operating balance of about \$1,300,000 and has a tax rate set at 29¢ per \$100 of evaluation.

The industrial exhibit, that ran for two days and was open to public inspection, was visited by Los Angeles city government officials including Supervisor *Frank Bonelli*.

## Tiernay Metal Supply Named Harvey Outlet

HAWTHORNE, CALIF.—Named a warehouse distributor for Harvey Aluminum mill products is Tiernay Metal & Supply Co., 11901 Inglewood Ave., where warehousing, distribution, and general offices of the firm are located.

Already established as an outlet for aluminum mill items for air and missile frame industries and the metalworking field, Tiernay will stock a full line of wrought products including A.N.D. sections, rod, bar, hollow bar, extrusions, structurals, pipe, tube and specialty shapes.

## Electronic Materials Newly Formed Company

SANTA MONICA, CALIF.—*Dr. R. C. Vickery* and *H. M. Muir*, co-discoverers of the recently announced thermoelectric material, gadolinium selenide, have formed a new company to prepare, and conduct research and development studies in, advanced materials necessary at the forefront of space-age technology.

The thermoelectric properties of gadolinium selenide were announced at the American Rocket Society Space Power Symposium here in September 1960, and have created interest in military and industrial circles.

Thermoelectric materials will, however, be only part of the interests of this new corporation which will enter electronic, magnetic, energy conversion, high-temperature and rare element materials fields.

The new organization is temporarily located at 2200 Colorado Ave., here.

## Hanjohn Co. Appoints Pacific Electro Sales

PASADENA, CALIF.—*Hanjohn Co., Inc.*, here, manufacturers of precision wirewound resistors, coil products, and tapwelders, has appointed Pacific Electro-Sales, Inc., Los Angeles, as representatives in Southern California, Arizona, and Southern Nevada.



## Convair Moving Dynapak Facility To San Diego

SAN DIEGO—Convair Div. of General Dynamics Corp. is moving its Dynapak facility from Pomona to San Diego. The facility manufactures high-energy rate metal forming machines and a line of advanced mechanical test equipment.

Production of Dynapak's machines will be done in an 18,000-sq.-ft. hangar structure at the seaplane ramp along Harbor Drive here. *Ralph Monsees*, assistant to the vice president and general counsel of Convair, said the move will be completed this month.

Monsees heads Dynapak as manager of Convair special products. He said the firm's special products will take over the east ramp area stretching north from the main entrance 800 feet along Harbor Drive.

"The move is being made," he said, "to give Dynapak the added advantage of existing facilities at Convair-San Diego." The test equipment and refined data computing systems here will expedite Dynapak's research and development on new high-energy rate metal forming devices, he said.

## Hastings Plastics To Stock Trevano Fabrics



Norry Hastings, president, Hastings Plastics, Inc., and Bill Winterhalter, Southern California sales manager, Coast Manufacturing & Supply sign agreement naming Hastings Southland distributor for Trevano glass cloth and tape.

SANTA MONICA, CALIF.—Coast Manufacturing & Supply Co. announces that Hastings Plastics, Inc., 1551, 12th St. will distribute a complete line of Trevano glass fabrics for industrial and tooling purposes in tapes and woven roving.

To support this distributorship, Trevano is establishing a local Southern California warehouse. This in com-

bination with a Livermore, Calif. warehouse represents the largest stock of glass fabrics and woven roving on the West Coast.

Sale of the item locally will be supervised by *Norry Hastings*.

## Chromalloy Has Small Car Anti-Smog Device

LOS ANGELES—Chromalloy Corp. and inventor *Charles W. Morris* have announced jointly the development of a "coffee-pot-sized" anti-smog device that is under testing and may sell in volume production for about \$50.

Small enough to fit under the hood of most cars, the firm says the device will take care of about 50% of exhaust emissions on newer cars, up to 80% on cars with more than 35,000 miles on the odometer.

Considered a "simple" device, it uses a Venturi system to draw outside air and engine gases into a burning chamber formed from mild steel and made heat and corrosion resistant by a Chromalloy process.

Morris' device consumes burnable quantities in the exhaust gases by a constant fire spark plug

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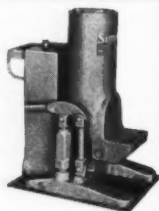
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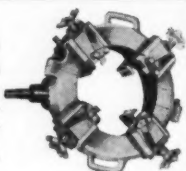
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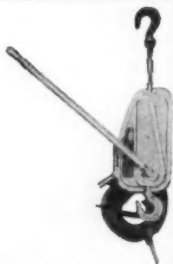
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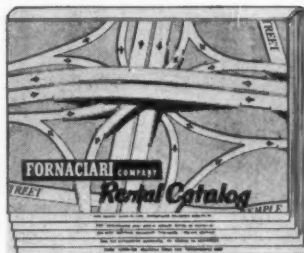
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### Rheem Acquires Calcor Steel Building Division

HUNTINGTON PARK, CALIF. — Calcor Corp. Steel Building Div. has been acquired by Rheem Manufacturing Co. who will place the operation under their Fullerton, Calif. Automotive Div. headed by *O. W. Carrico*, vice president and general manager.

Announcement was made by Rheem president, *A. Lightfoot Walker*, and *Andy F. Brown*, president of Calcor. Calcor operations will remain in a 100,000 sq. ft. Huntington Park facility under direction of *Bernard Perlin*, vice president and general manager of the firm.

Calcor has been actively engaged in construction of steel commercial structures using an insulated, modular steel wall panel assembled on a light steel frame. Fireproof, panels will take paint or standard exterior finishes.

### Narmco Industries Acquires New Plant

SAN DIEGO — Narmco Industries, Inc., a wholly-owned subsidiary of Telecomputing Corp., has purchased Electro Instruments, Inc.'s research facility, it was jointly announced by *Jonathan Edwards* and *Wm. R. Whittaker*, respective presidents of the two corporations.

The newly acquired facility is 43,000 sq. ft. on approximately 11 acres in San Diego's Research Park. It is immediately adjacent to Narmco's Research & Development division.

After modification, it will be utilized to expand the company's studies in the fields of materials and structures, Whittaker said.

### Outstanding Safety Record At U.S. Rubber Tire Plant

LOS ANGELES — The United States Rubber Co. tire plant here has compiled a record of 1,000,000 man hours of production during which time there were no employee lost time injuries, according to *Ben S. Adams*, factory manager.

Earlier this year a six-months period elapsed during which nearly 2,000,000 man hours were completed with no lost time accidents occurring.

A constant campaign under the direction of *J. F. Harman*, safety engineer, is in progress to reduce possibilities of injuries to personnel.

### Announce Formation Of Tison-Pease, Inc.

LOS ANGELES — Formation of Tison-Pease, Inc., was announced recently by *Charles L. Jones*, secretary of the firm and Santa Monica industrialist. Headed by *William F. Pease*, until recently general manager of the Nuclear Div. of American Electronics, Inc., the new firm will comprise two separate divisions.

The Tison Nuclear Div., under the general management of *Phil Gintz*, will operate the non-destructive Radi-flo test facilities in Culver City. In addition, the division will be engaged in the development and production of classified types of nuclear energy cells.

The second division of Tison-Pease, Inc., will be the Tison Electronic Div., under the general management of *Paul K. Bennett*.

Headquarters have been established at 2226 South Sepulveda Blvd., Los Angeles, adjoining the facilities of Tison Engineering, Inc.

### Missile Systems Corp. Acquires DataMation

NORTH HOLLYWOOD, CALIF. — Missile Systems Corp., manufacturers of electronic assemblies and components for the missile and avionics industries, has announced the acquisition of DataMation, Inc., of Los Angeles.

Board chairman of Missile Systems *F. W. Bailey* said the DataMation acquisition would increase sales in the coming fiscal year by more than \$3,000,000 and should contribute substantially to Missile Systems' overall earnings for the year.

DataMation is engaged in data reduction, processing, and documentation for the missile and space age industries.

Bailey said *Philip L. Kramer* will remain president of DataMation.

### Wagniere Engineering Moves To New 17,000 Sq. Ft. Plant

INGLEWOOD, CALIF. — Occupying a new facility at 11010 Anza Ave., is Forrest Wagniere Engineering, a firm engaged in manufacture of hydraulic and pneumatic fuel equipment for the air and missile frame industries.

Adjacent to this facility at 11008 Anza is a quality control and environmental testing facility operated by the firm.

## Sierra Electronic Corp. In Expanded Facilities

MENLO PARK, CALIF.—President James M. Skinner, Jr. of Philco Corp. formally dedicated expanded facilities here recently of the Sierra Electronic Corp. Div. of the Company's Government and Industrial Group.

The expansion consisted of adding 50,000 sq. ft. of manufacturing space to an existing 35,000 sq. ft. building. The additional space was required for the Company's increased volume of business in Research and Development and in manufacture of electronic equipment.

Willard Feldscher, vice president and general manager, declared the Div.'s employment would increase from a pre-expansion level of 200 to nearly 500 employees.

The facilities are located at 3885 Bohannon Drive, Menlo Park, Calif., in the Bohannon Industrial Park.

## Ohline Mfg. Opening Factory in Arizona

SNOWFLAKE, ARIZ.—The Ohline Mfg. Corp., of Pasadena and Culver City, Calif., makers of movable louver shutters, will open a branch factory here, William H. Conn, president, has announced.

The company has leased a four-acre tract and a 7,000 sq. ft. building and expects to have production under way by January. Some 30 persons will be employed with a \$100,000 annual payroll by the end of the first year. William Hogrewe will be plant manager.

Executive Vice President Robert Oliver said the company was expanding to Arizona because it will be closer to its source of white pine and will put the company in a more competitive position with Japanese imports.

## Rapistan Names Sacramento And Fresno Representatives

SACRAMENTO, CALIF. — Rapistan of California, Inc. has announced the appointment of the Capital Machine and Welding Co., here, and the Commercial Manufacturing & Supply Co., Fresno, as authorized dealers of conveyor products.

E. D. Hoyt, Rapistan president, announced the appointments.

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## New Plant Producing Cement Roofing Tile

MESA, ARIZ. — A new manufacturing plant making cement roofing tiles, Arizona Comaco Roofing Tile, Inc., has been opened, President *Joseph Martineau* has announced.

The company is owned and operated by the five Martineau brothers of Mesa, leasing specialized machinery for making the tile from National Comaco, Inc. Production facilities are located in temporary quarters at 256 S. Serrine.

When the company reaches full production within the next few months, it is expected about 30 persons will be employed in a new building to be constructed on W. Fourth Avenue at Dobson Road, Martineau said.

## Weyerhaeuser Following Production Cut Program

TACOMA, WASH. — Consolidation of plywood production facilities of Willamette Sheathing Co. with those of Weyerhaeuser Co.'s lumber and plywood division at Arcata, Calif., was announced recently by *George H. Weyerhaeuser*, vice president of the timber products firm.

The closure of Willamette's manufacturing facilities will reduce temporarily the company's local plywood output about one-third, Weyerhaeuser said.

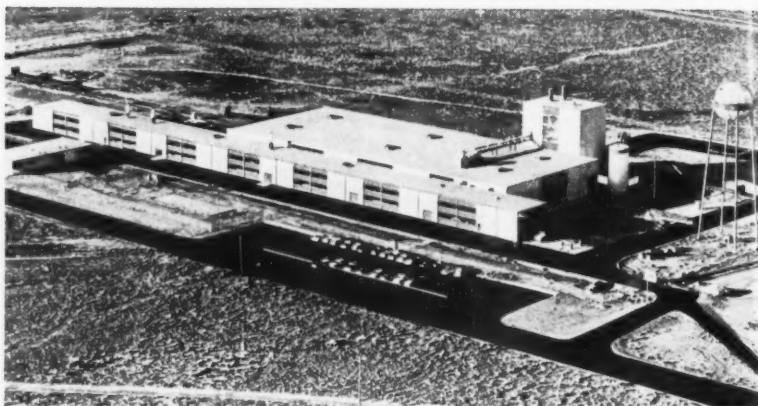
The move follows a recent announcement that the firm was curtailing production of both plywood and lumber due to poor market conditions.

## GE to Work on Reactor For Nuclear Powering

SAN JOSE, CALIF. — General Electric has announced that in conjunction with seven New York State utilities it will build an \$8,000,000 superheat developmental reactor at nearby Pleasanton, Calif., to help extend technology of nuclear superheat for eventual application to large scale nuclear power plants.

The new reactor will be designed, built and owned by the GE's Atomic Power Equipment Dept. at its Vallecitos Atomic Laboratory near Pleasanton, according to *George White*, APED general manager. Initial operation is planned for 1962.

## New American Gypsum Plant in Production



A little over eight months after groundbreaking, initial production is underway at American Gypsum Co.'s new plant some five miles northeast of Albuquerque. The product is gypsum wall board and the source of supply is an open deposit of gypsum on the mesa about 35 miles northwest of Albuquerque. The raw material is scooped into ore trucks and transported to the factory shown here. Employment will be approximately 85 persons.

ALBUQUERQUE, N. M. — The new \$3,000,000 American Gypsum Co. plant here has started production and shipment of gypsum wall-board and other products, it was reported recently.

Capacity of the new facility is rated at 400,000 board-feet of gypsum products daily. All of the plant's operations from delivery of crude ore to the

finished product is free from manual labor.

The only operation requiring human hands is stacking and storing of gypsum board and even this is to be automated in the near future.

Sales currently are being concentrated in New Mexico, Colorado, Wyoming, Texas and Arizona.

## Pam-Pro Plastics in New Menlo Park Plant

MENLO PARK, CALIF. — Pam-Pro Plastics, fabricator of precision plastic parts, has announced final location of all manufacturing and headquarters facilities in its newly-constructed plant at 1075 O'Brien Drive, here.

Serving the San Francisco peninsula area, the company manufactures missile and aircraft components, heat shielding, electronic parts, medical units, and marine bearings for a wide segment of industry.

Previously located at nearby Redwood City, the new facilities aggregate 12,000 sq. ft. of floor space, compared with 6,000 at the previous location.

## P.I.E. Purchase of Bond Trucking Okayed by ICC

OAKLAND, CALIF. — The Interstate Commerce Commission has approved the purchase and merger of Bond Trucking Co., South Gate, Calif., by Pacific Intermountain Express of Oakland.

The merger extends P.I.E.'s operation into the greater San Diego area.

Rights acquired will also embrace the general area between Costa Mesa-Santa Ana and Riverside-San Bernardino through and including Corona which area will be served by P.I.E.'s Los Angeles and Pomona terminals.

The San Diego area will be served by the P.I.E. terminal at 5262 Anna St., San Diego, with *T. E. Christopher* as branch manager.

## Bourns Purchases Future Plant Site in Riverside

RIVERSIDE, CALIF. — The purchase of 45 acres here for a future plant location was announced recently by *Marlan E. Bourns*, president of Bourns, Inc. Plans for a construction project designed to ultimately provide half a million square feet of floor space will be started immediately while actual construction is expected to be under way within two years.

The development of the plant will be in keeping with the park-like nature of the area with emphasis being placed on landscaping as well as functional aspects. When fully developed, the new site will accommodate 5,000 persons.



## Arizona Steel Mill Under Construction

COOLIDGE, ARIZ.—A multi-million dollar steel mill, which will produce high-grade steel from a nearby deposit of low-grade iron ore, is under construction on an 80-acre site two miles north of Coolidge. Completion is scheduled for late spring.

The plant, known as Arkota Steel Co., will produce 75 tons of iron and steel ingots a day, according to *Patrick H. Feeney*, president. Other officers of the new industry are *Marnel Lindenkugel* and *Julius D. Madaras* as vice presidents.

Fifty persons will be employed at the mill and another 20 will mine and truck the ore. The ore will come from an open pit mine 35 miles south of Florence, where the deposit covers some 50,000 acres and contains an estimated half billion tons of recoverable ore. Tests indicate that in many areas the black sand contains from 5 to 15% recoverable iron concentrate.

Madaras said the mill will use a new steel making process which he developed and which eliminates the blast furnace and uses no coke nor scrap metal. This process has been in use at a mill in Longview, Tex., which is being dismantled to build the Coolidge plant, Madaras said.

## Western Joint Computer Conference Scheduled

LOS ANGELES—The annual Western Joint Computer Conference has been scheduled for May 9-11 at the Ambassador Hotel, here, according to an announcement by *Dr. Walter F. Bauer*, general chairman for the 1961 meeting.

Theme of the conference and exhibits, "Extending Man's Intellect," is planned to bring out new techniques and applications for automatic information processing equipment. The conference will emphasize equipment design, uses, and functions in new areas of computer applications.

## Simplex Jack Makers Open San Francisco Warehouse

SAN FRANCISCO—To facilitate distribution for West Coast users and distributors of Simplex mechanical and hydraulic jacks, Templeton, Kenly & Co., Broadview, Ill., have announced the opening of new warehouse facilities here.

## Santa Fe Completes Arizona Line Change

LOS ANGELES—Santa Fe Railway's 44-mile line change through the rugged mountains of northern Arizona has been completed and was opened to traffic December 19.

The \$20,000,000 project is designed for speeds of 90 miles an hour for passenger trains and 60 miles for freights, effecting a saving of more than one hour on transcontinental freight schedules.

## Automatic Plastic Molding Installs Injection Press

BERKELEY, CALIF.—As part of an expansion and modernization program, Automatic Plastic Molding Co., here, has announced installation of a new injection press to turn out light weight products at extremely high speeds.

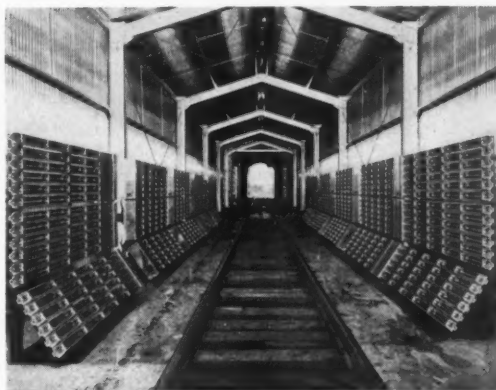
Completely automatic and requiring only a standby operator, the press was produced by Van Doren Iron Works of Cleveland. It has a mold clamping pressure of 100 tons.

## MONTGOMERY BROTHERS, INC.

### ENGINEERING REPORT NO. 8

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The above installation, typical of the many new uses of Far-Infrared Heat, solves a difficult problem for the Railroad Industry.

Looking for new ways to improve efficiency, Railroad men have come to understand what far-infrared heat can do for them. The above installation is typical. No longer are car dumping schedules a serious problem. Flame damage has disappeared and winter dumping costs are back in line. This only suggests what an infrared source might do for you in your field.

Let's look at the advantages:

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7. Space saving compactness!

Montgomery Brothers and Chromalox offers packaged electric radiant ovens—complete with conveyors, panelboards, framing, even completely installed and tested out where desired.

We strongly urge you to analyze your present installation or one that you are proposing and see if Montgomery Brothers couldn't help you save on costs and improve on results with infrared heat.

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## Contract News for the West

The U. S. Army Ordnance District, Los Angeles, with headquarters at 55 S. Grand Ave., Pasadena, announced Dec. 16 the award of over \$4,000,000 in Army Ordnance contracts during the past five weeks to the following contractors:

*Sperry Utah Engineering Laboratory*, Salt Lake City, \$1,138,572 for Sergeant missile ground handling equipment.

*Aeronutronic*, Div. of Ford Motor Co., Newport Beach, Calif., \$997,000 for continued research and development on the Shillelagh missile system.

*Firestone Tire & Rubber Co.*, Los Angeles, \$599,997 for engineering services related to the Corporal missile system.

*Gilfillan Brothers, Inc.*, Los Angeles, \$599,200 for engineering services related to the Corporal missile system.

*Lear Inc.*, Astronics Div., Santa Monica, Calif., \$211,994 for research and development on gyroscopes.

*Telemetering Corp. of America*, Sepulveda, Calif., \$185,158 for telemeters and ground equipment.

*U. S. Steel Corp.*, Consolidated Western Steel Div., Los Angeles, \$99,619 for motor case assemblies.

*Resdel Engineering Corp.*, Pasadena, Calif., \$89,789 for phaselock converter systems.

*Harvey Aluminum, Inc.*, Torrance, Calif., \$52,749 for design and development of a demolition kit, and \$27,500 for research and development of a rifle mount and breech.

*Cubic Corp.*, San Diego, \$80,000 for research and development of an electronic trajectory measuring system.

*Douglas Aircraft Co., Inc.*, Santa Monica, \$57,735 for Nike missile repair parts.

*Interstate Electronics Corp.*, Anaheim, Calif., \$54,742 for airborne transponders.

*Lockheed Aircraft*, Burbank, Calif., \$45,913 for fiberglass propellant envelopes.

*Radioplane Div.*, Northrop Corp., Van Nuys, Calif., \$34,858 for target missile flight services.

Other contracts reported to WESTERN INDUSTRY during December include the following:

*Hughes Aircraft Co.*, El Segundo, Calif., plant, \$6,600,000 from Navy for continued production of inertial guidance systems for Polaris missile.

*Lockheed's California Div.*, \$4,941,573 from U. S. Navy for electronic re-equipment of 69 P2V Neptune antisubmarine aircraft. Also a U. S. Air Force study contract aimed at determining the feasibility of logistics-maintenance and support vehicles for space operation. The initial study program, including a \$90,000 study allocation, was authorized by Wright Air Development Div.

*AiResearch Mfg. Div.*, Garrett Corp., Phoenix, \$3,500,000 from Air Force for air turbine starters and motors for the Republic F-105. Also, \$1,000,000 from Air Force Material Command for dual cartridge-pneumatic engine starters for the F-105.

*Eitel-McCullough, Inc.*, San Carlos, Calif., \$1,300,000 from U. S. Air Force for electron power tubes.

*Tamar Electronics, Inc.*, Gardena, Calif., \$1,000,000 from Air Force for countermeasure systems for installation in aircraft of the Strategic Air Command.

*Wayne Mfg. Co.*, Pomona, Calif., more than \$1,000,000 from Air Force for 90 air-jet vacuum runway sweepers.

*Electrada Corp.*, Airite Div., Beverly Hills, Calif., more than \$850,000 for titanium pressure vessels from Convair Astronautics Div., General Dynamics Corp.

*Telecomputing Corp.*, Los Angeles, more than \$800,000 from Autonetics Div., North American Aviation, Inc., for equipment used in conjunction with the Air Force's new Minuteman intercontinental ballistic missile.

*Servomechanisms, Inc.*, El Segundo, Calif., \$773,000 follow-on order from Douglas Aircraft Co. for True Airspeed Computers.

*Consolidated Systems Corp.*, Monrovia, Calif., \$346,000 from Lockheed Aircraft Corp., Marietta, Ga., for additional missile scoring systems.

*Electro-Optical Systems, Inc.*, Pasadena, \$99,996 for study of advanced condensing techniques for space vehicle heat rejection systems and \$96,212 for design and development of ultra-lightweight solar concentrators from National Aeronautics and Space Administration.

*Harvill Corp.*, Los Angeles, \$157,000 from Aerojet-General Corp. for die casting components.

*Computer Engineering Associates, Inc.*, Pasadena, \$61,000 from Convair Div., General Dynamics Corp., for power supply instrumentation for Tartar missile.

*Duke's Electric Inc.*, Pasco, Wash., \$85,279 by Atomic Energy Commission for additions and alterations to an existing power substation and construction of a new, smaller substation in the 300 area of Hanford Works, Wash.

## CLASSIFIED SECTION

Space is sold as advertisers' inches. All advertisements in this section are 1/8 inch short of contracted space to allow for borders and composition. Rates are \$16.00 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 25th if no proofs are required.

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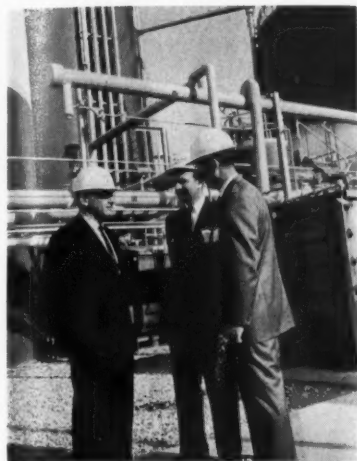
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## Linde Co.'s New Torrance Hydrogen Plant



Attending the first public tour of the Linde Co.'s new liquid hydrogen plant at Torrance, Calif. recently are, left to right, I. M. Stewart, vice president, Union Carbide Corp.; William B. Nicholson, president Linde Co., Div. of Union Carbide Corp.; and R. F. Smith, production manager, Los Angeles region, Linde Co.

TORRANCE, CALIF.—William B. Nicholson, president of Linde Co., Div., Union Carbide Corp., acted as host

last month during the first major tour of his firm's new liquid hydrogen plant located near the greater Los Angeles industrial and missile development centers.

The first privately funded and operated liquid hydrogen producer, the plant is capable of producing 13,000 lbs. per day of the substance that far exceeds requirements of the National Aeronautics and Space Administration. Prime use of the product is for rocket fuel.

Industrial users of liquid hydrogen in the Los Angeles area are being supplied by trailer-truck shipments and by deliveries in 150-liter containers.

During an informal luncheon following the tour, Nicholson said that Linde had just received the green light on development of a new liquid hydrogen plant in the Fontana, Calif., area, adjacent to Kaiser Steel's plant. By-products of Kaiser coke ovens will be used in liquid hydrogen production.

This plant will far exceed the capacity of the current Torrance facility, Nicholson said.

## ICC Approves Garrett Freightline Mergers

POCATELLO, IDAHO—In a joint announcement Dec. 27, the presidents of three major Western motor carriers revealed that the Interstate Commerce Commission had granted approval of their application of purchase and merger.

Clarence A. Garrett, president of Garrett Freightlines, here, said the ICC had authorized his company to purchase Inland Motor Freight of Spokane as well as its subsidiary, Pacific Highway Transport of Seattle, and effect a merger of a third company, Northwest Freight Lines of Billings, Mont.

Effective date of the ICC Order is Feb. 1, which also allows a period of 180 days for Garrett Freightlines to effect the purchase-merger. The parent company will be Garrett Freightlines.

According to the agreement, Garrett will purchase Inland and its affiliates for \$2,175,000. In acquiring Northwest Freight Lines and its affiliates, Garrett will issue to stockholders of three companies in the Northwest organization a total of

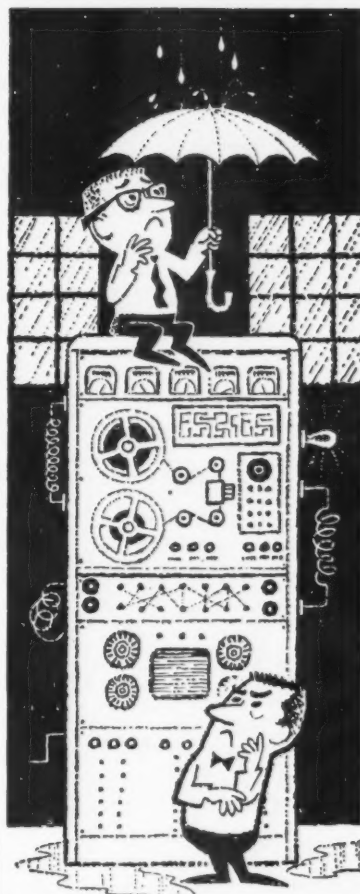
182,448 shares of Garrett common stock having par value of \$1.66 each.

"The company will now operate over 2,000 freight vehicles to provide daily service to approximately 12,000 route miles. Anticipated gross revenue should reach \$30,000,000, with an annual payroll of almost \$15,000,000 for 2,500 employees in 13 Western states," President Garrett said.

## Dyna-Matics Acquired By U. S. Systems, Inc.

LOS ANGELES—U. S. Systems, Inc., here, has acquired all capital stock of Dyna-Matics Corp., of Sun Valley, as a wholly-owned subsidiary, it was announced recently by Fred A. Thaheld, president. This is the fourth acquisition by U. S. Systems within the past year, bringing combined annual sales to over \$2,000,000.

J. H. Overholser, president of Dyna-Matics, will continue in the top executive post. Dyna-Matics, to continue operation under its original name, designs, develops and manufactures valves, regulators, pumps and other control equipment. Founded in early 1960, its annual sales are estimated at \$500,000.



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■ **L. A. Napper** has been appointed assistant to chief engineer, fabricated steel construction, Bethlehem Steel Co., Pacific Coast Div., San Francisco.

■ **Herbert O. Johnson** has been named general manager of Yuba Mfg. Div., Benicia, Calif.

■ **Fred J. Robbins**, Los Angeles steel executive, has been elected president and chief administrative officer of Bliss & Laughlin, Inc., Harvey, Ill.

■ **Leslie S. Morrill** is newly named plant manager, Lyon Metal Products, Inc., Los Angeles.

■ **Stanley B. White** has been appointed vice president, manufacturing, aluminum, for Kaiser Aluminum & Chemical Corp., Oakland, Calif.

■ **John B. Jones** has been appointed operations manager, Kilsby-Tubesupply, Los Angeles.

■ **Thomas P. Pike** succeeds retiring **P. M. Pike** as chairman of the board, Republic Supply Co. of California, Los Angeles.

■ **Lucius H. Bassett** of Torrington, Conn., div. of Anaconda American Brass Co., will become plant manager of Los Angeles div. April 1.

■ **Norman J. Peterson** has been named co-ordinator of General Electric's newly established Defense-Aerospace office, San Francisco.

■ **Morton J. Reynolds** has been named superintendent of Colorado Fuel & Iron's South San Francisco plant.

■ **R. H. Hancock, Jr.**, has been appointed district manager, Salt Lake City and Denver, Jeffrey Mfg. Co., mining division products.

■ **Dar Johnson Sr.** has been named director of personnel, Hyster Co., Portland.

■ **Thomas J. Bannan**, president of Western Gear Corp., San Francisco and Seattle, has been elected to board of Chain Belt Co., Milwaukee.

■ **Dr. J. Trevor Law** has been appointed senior engineer, Materials Dept., Motorola Semiconductor Products Div., Phoenix.

■ **E. C. Henning** is newly named manager, Western regional sales, Brown Trailer Div., Clark Equipment Co.

■ **Ira E. Weston**, founder and chairman of board of Weston Hydraulics, Ltd., Van Nuys, Calif., passed away recently.

■ **Joseph H. Moore**, aircraft executive, Los Angeles, passed away recently.

■ **Harlan B. Gould** has joined MS&A, Inc., Hawthorne, Calif., as a senior consultant.

■ **Harvey E. Rennacker** has been appointed senior staff engineer, Bendix Computer Div., Los Angeles.

■ **Harold Deck** has been named design engineer, Components for Research, Inc., Palo Alto, Calif.

■ **Robert J. Owens** has been promoted to safety engineer, Pacific Gas & Electric Co., San Francisco.

■ **Robert F. Moody**, general sales manager, Hyster Co., Portland, has been named president of The Material Handling Institute, Inc.

■ **Dale Dowis** is newly named chief application engineer, IMC Magnetics Corp., Western Div., Maywood, Calif.

■ **Donald J. Hauck** is new operations manager, Los Angeles branch, Central Scientific Co.

■ **Howard G. Vesper**, Oakland, Calif., was re-elected president, Western Oil and Gas Association.

■ **Wally Peters** has been transferred to service the San Jose, Calif., area for the Geo. R. Borrmann Steel Co.

■ **J. V. Naish**, president of Convair, division of General Dynamics Corp., is elected chairman, board of governors, Aerospace Industries Association.



- *Walter C. Russell* was elected president and chief executive officer, Hawaiian Cement Corp., Honolulu.
- *B. B. Bradish* has been named Intermount district representative, Denver, for Columbia Steel Casting Co., Inc.
- *John B. Mandle* has been promoted to assistant director of operations, Consolidated Systems Corp., Monrovia, Calif.
- *Harry K. Orbach* has been appointed manager, plasma chemistry, MHD Research, Newport Beach, Calif.
- *George F. Grady* has been appointed vice president and general manager, Woodall Inc., El Monte, Calif.
- *Berton E. Dotter, Jr.*, has joined Lenkurk Electric, San Carlos, Calif., as a senior electrical engineer in Government Systems Engineering.
- *Jack K. Walker* has joined Packard Bell Electronics, Los Angeles, as director of product planning for Defense and Industrial Group.
- *Chester I. Keasling* has been named manager, Tabo Chemical Corp., San Valley, Calif.
- *Charles R. Graff* has been named Western region manager, Oakland, Calif., for Raymond Concrete Pile Div. of Raymond International Inc.
- *Ray W. Sanders* has been elevated to director of Satellite and Space Laboratories, Space Electronics Corp., Glendale, Calif.
- *Allan W. Scott* has been appointed assistant manager, research and development department, Hughes Aircraft Co.'s microwave tube div.
- *H. D. Carlson* has been elected vice president, Southwestern Engineering Co., Los Angeles, and named manager, Engineering and Construction Div.
- *Ben Krinitz* has been elected president, Furniture Manufacturers Association of California, Los Angeles.
- *Joseph R. Zappa* is new superintendent, Republic Steel's Union Drawn Steel Div., Los Angeles.
- *Donald T. Whalen* is new marketing manager, Tidewater Oil Co., Los Angeles.
- *Robert P. Miller* has been named coordinator, safety and personnel, Western Operations, Long Bell Div., International Paper Co., Longview, Wash.
- *Edward F. Burg* has been appointed manager, pilot engineering, Trimpot Div., Bourns, Inc., Riverside, Calif.
- *Gerald W. Olmsted* is newly named purchasing agent, Sierra Electronic Div., Philco Corp., Palo Alto, Calif.
- *L. E. Mineah* has been promoted to executive vice president and general manager, Aero-Cal Metal Fabricators Inc., Gardena, Calif.
- *Richard L. Shelton* has been promoted to director of operations, Telecomputing Corp.'s Whittaker Gyro Div., Van Nuys, Calif.
- *R. D. Ronketti* is newly appointed manager American Can Co.'s plant at Wilmington, Calif.
- *Fred W. Burtner* has been appointed manager, industrial department, Los Angeles Chamber of Commerce.
- *John P. Hastings* has joined staff of Canoga Electronics Corp., Van Nuys, Calif., as manager, special projects.
- *Dr. E. Ackerlind* has joined research and development staff, Lynch Communication Systems Inc., San Francisco.
- *Don E. Ulery* has joined the industrial division sales force of A. B. Boyd Co., San Francisco.
- *Earle M. Jorgensen*, president and chairman of Earle M. Jorgensen Co., Los Angeles, has been elected to board of American Potash & Chemical Corp.
- *James D. Moran*, Flintkote Co., Los Angeles, has been named assistant to the president, New York.
- *Thomas F. Humphrey* has been named vice-president and general manager, Tempron, Inc., Reseda, Calif.
- *Durward Graham* is newly appointed manager of technical publications, Daystrom's Control Systems Div., La Jolla, Calif.
- *Bill M. Lane* has been named manager Western operations, Vitro Engineering Co., Los Angeles.
- *Lawrence H. Price* will manage market research and new product development for Pacific Lumber Co., San Francisco.
- *Dr. Weldon B. Gibson* has been appointed executive vice president Stanford Research Institute, Menlo Park, Calif.
- *John W. Hawley* has been named chief products engineer, Thermoplastics of the Molded Products Div., Stauffer Chemical Co., Los Angeles.
- *Patrick W. Timberlake*, vice president Northrop Corp., Beverly Hills, Calif., has been named to head the firm's International Div.
- *Philip R. Samwell*, vice president-general manager Friden, Inc., San Leandro, Calif., has accepted nomination to board of directors, National Association of Manufacturers.
- *Jack Gillette* is new associate director of engineering, Standard Rectifier Corp., Santa Ana, Calif.
- *David W. Jones, Jr.*, Denver, has been appointed Rocky Mountain area representative for American Welding & Mfg. Co.
- *Craig C. Gregerson* has been named sales engineer, E. C. Buehrer Associates, Inc., Oakland, Calif.
- *Frank E. Maddocks* has joined the Santa Monica, Calif., engineering office of Arthur D. Little, Inc.
- *Norman J. Regnier* has been named manager military relations, International Rectifier Corp., El Segundo, Calif.
- *Elfie Cardone* has been named manager customer services and *Harley A. Bates*, office manager, Columbia Wax Co., Glendale, Calif.
- *Robert Rothschild*, president of Rothschild, Raffin & Weirick, general contractors, San Francisco, was appointed chairman, Building Industry Conference Board for 1961.
- *J. George Warneck* has been named sales engineer, Los Angeles office, Sel-Rex Corp.
- *Fred A. Speaks* has been named director Marketing Div., Eitel-McCullough, Inc., San Carlos, Calif.
- *Thomas O. Walthall* has been named vice-president, administration, Stanley Aviation Corp., Denver.

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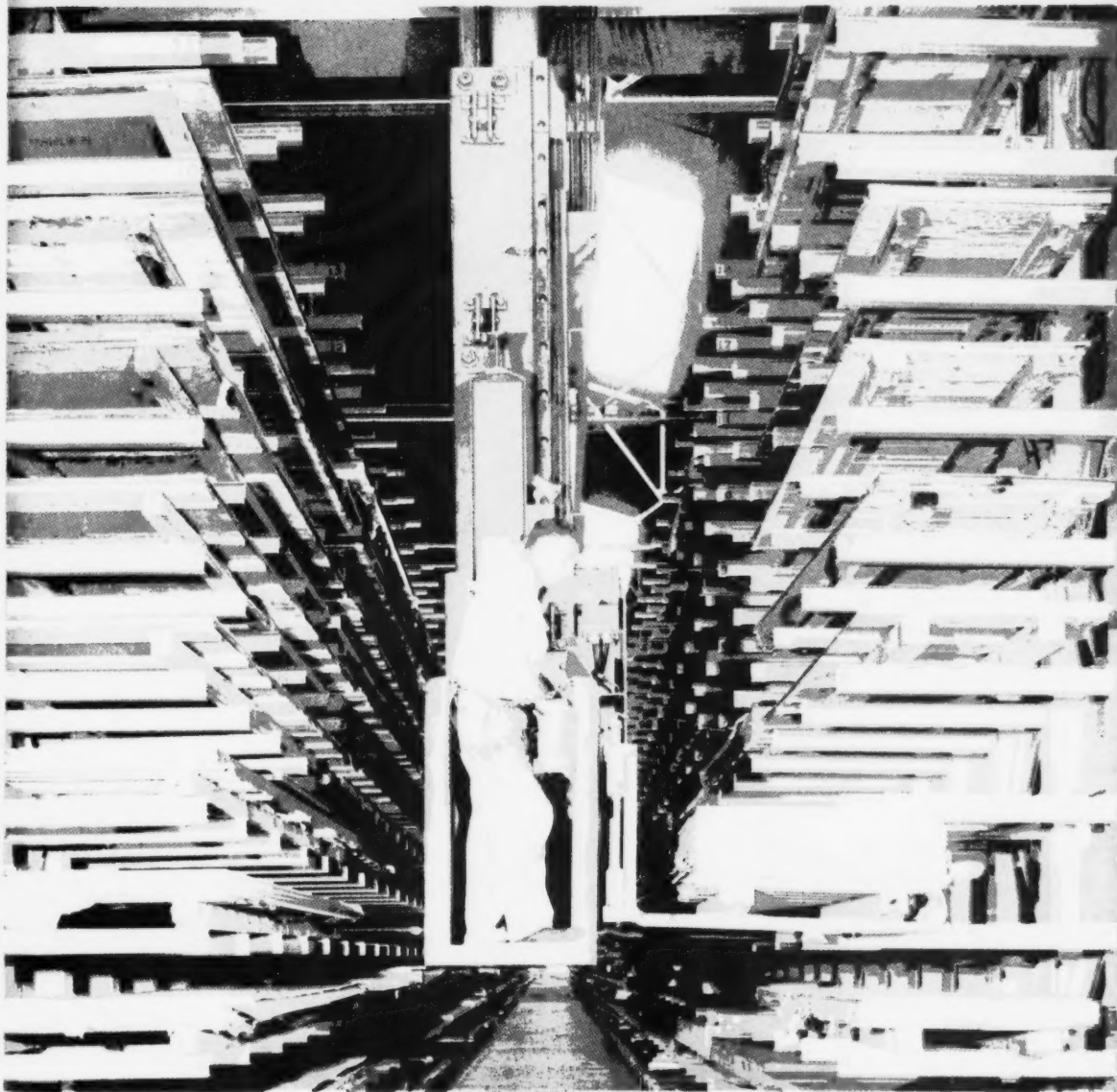
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